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ABSTRACT

Focusing on current environmental issues and strategies for preparing for the future, this document provides the following conference papers: (1) "Preparing Environments for the 21st Century," by Bailus Walker, Jr.; (2) "Green vs. Greed: Development and Conservation," by John Ferrara; (3) "Plants and People: A Developing Relationship," by Alan Shatteen; (4) "Forests Dying -- Cultures Crying," by Phyllis Weinstein; (5) "Adoption of Community Water Supply in Three Villages in Muhafizat Kafr Al Shaykh, Egypt," by David B. Belasco; (6) "11 Billion in 2025! Will Malthus Prove to Be Correct," by Donald Jelfo; (7) "The Built-In Momentum for World Population Growth," by John Holian; (8) "Eudaimonia," by Eleonore S. Adams; (9) "The Cleveland Worsted Mills: A Case Study in Lost Opportunities," by Richard Karberg; (10) "The Impact of Social and Physical Environment on Our Children and Youth," by Frederick C. Robbins; (11) "Can Satisfaction Be Found in Poor Neighborhoods? The Case of Cleveland's Elderly," by Valerie Brown; (12) "Urban Children at Risk," by Wendy F. Marley; (13) "The Availability of Firearms and the Impact of Violence By and Against Children and Youth," by Joal Hill; and (14) "Preparing Arts Environments for the 21st Century," by Nina Freelander Gibans. (KP)

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CUYAHOGA COMMUNITY COLLEGE
FACULTY SYMPOSIUM
1994

PREPARING ENVIRONMENTS FOR THE 21st CENTURY

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CUYAHOGA COMMUNITY COLLEGE
FACULTY SYMPOSIUM 1994

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Preparing Environments for the Twenty-First Century

1994 FACULTY SYMPOSIUM

The 1994 Cuyahoga Community College Annual Faculty Symposium was held on March 5, 1994, at the Metropolitan Campus of the College. The symposium, the eleventh such event, was designed initially to present the talents, knowledge, and expertise of the College faculty as they address major issues in our society. Since its inception, the Symposium format has broadened to include prestigious outside speakers from Cleveland's academic, civic, governmental, and corporate communities. The topics chosen for the Symposium have focused on contemporary issues of not only local, but national and global concern as well.

The 1994 Symposium's theme, "Preparing Environments for the Twenty-First Century," turned our attention to the dual topic of environmental issues here and now and the possibilities of the future with an emphasis upon the necessity of preparing that future in a humane, just, and rational manner. What we do today and how we do it will determine the future our children and theirs will inherit. The old attitude that the future will look out for itself has not only been proven false, it has been proven dangerous. "The future," someone once said, "isn't what it used to be." If that is true, it is because no one thought to prepare wisely for it. The days when settlers could arrive in a new land, exhaust the soil, and then blithely move west are over. It has been a century since Frederick Jackson Turner proclaimed the end of the frontier. Geographically, there was nowhere else to go once the Pacific had been reached and the lands between the oceans had been settled. The ending of that frontier, however, has opened a new one: a challenge to cherish and preserve our planet for those who come after us. It is in exploring this frontier that we shall truly go where no one has gone before.

The presenters at the Symposium addressed a myriad of issues, pointing out the numerous challenges that need to be overcome in order to create the humane and just future on an environmentally diverse and thriving planet that we desire. Topics ranged from economic concerns, including the perception that there is a conflict between environmental solicitude and developmental issues such as employment, to population issues which touched not only on numbers but quality of life as well. While current problems such as urban neglect and the scarcity of water were examined, presenters, in a spirit of optimism for the coming century, put their emphasis in these and other areas in identifying problems and finding solutions with sessions focusing on designing urban environments, nurturing an awareness of environmental needs, and building new collaborations for new solutions. The papers contained in these proceedings testify to the commitment and vision of the presenters who made the symposium such a fruitful dialogue between themselves and the representatives of the community who attended.

The cautious optimism which permeated the workshops was reinforced by the enlightening and challenging remarks made in the Opening Address by Dr. Bailus Walker, Professor of Occupational and Environmental Health and Dean of the College of Public Health at the University of Oklahoma Health Sciences Center in Oklahoma City, Oklahoma, and by Dr. Timothy Fields, Jr., Director of the Superfund Revitalization Office of the U.S. Environmental Protection Agency, in his Keynote Luncheon remarks.

Special thanks and appreciation go to CCC's Scholar-in-Residence, Nobel Laureate Frederick Robbins, MD and to The Honorable Mary Rose Oakar and Dr. Laura Blunk who co-chaired the Symposium. Thanks are also due to the United States Environmental Protection Agency which provided partial funding for the Symposium and to The Garden Center of Cleveland, The Cleveland Health Museum, and The Cleveland Museum of Natural History for their cooperation in this collaborative project.

The Board of Trustees, the President, and all the Cuyahoga Community College Family are unanimous in their pride and support of the Annual Faculty Symposium. We look forward to the Twelfth Annual Faculty Symposium, "Weaving the Fabric of Community."

Preparing Environments for the 21st Century

BAILUS WALKER, JR., PH.D., M.P.H.
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It seems appropriate to start an assessment of environmental status and trends with a consideration of at least one of the underlying forces shaping environmental conditions — population growth and shifts.

The population of the United States, including the Armed Forces overseas, grew by almost 24 million persons from the beginning of 1980 to the beginning of 1990. In the latter part of the decade, population growth was sustained by an increase in rates of childbearing among women in their thirties. In the absence of this increase, the rate of population growth would have diminished as the population of childbearing age grew older. Health statistics show that mortality continued to improve during the 1980s, but the rate of improvement was less than for the previous decade.

While the nation's average annual rate of population growth remained stable in 1980s, there were significant variations in rates of population change within and between regions, divisions, and states.

As population levels of some sections of the country ascended to a wave of immigration in the 1980s, the growth of others diminished with the outflow of migrants. In some states the population dropped below the 1980 level early in the decade but later recovered and exceeded the 1980 level. In other states high rates of population growth in the early 1980s were later replaced with reduced rates of growth. There were also states that experienced population losses every, or nearly every, year in the decade.

For the United States the environmental implications of population trends are both positive and negative. On the positive side, the reduced growth rate argues well for lowered resource consumption, crowding, and pollution.

The shifts in populations often mean placing a stress on limited water supplies. Many of the fastest-growing states are already short of water. In many cases water quantity is related to quality. A sufficient lowering of water quantity in a lake or river, or in ground water could destroy all of its designated uses — both primary and secondary. Population dispersion is also eating up prime farmland and valuable wildlife habitat through housing and commercial conversion and creating conflicts with other land uses.

As we meet here today environmental policy is suspended between old problems and new. It has become increasingly clear that the understanding of environmental problems in the early 1970s, when the framework for current government programs was established, has been superseded by knowledge gained during the past few decades.

The nation's environmental policies were formulated in earlier periods according to specific media — air, water, and land — and relatively circumscribed approaches to pollutants and their sources. Unfortunately, U.S. environmental protection laws seek to control pollutants as if they remain in the same medium — the air, water, or soil to which they were initially released. But many pollutants are discharged into more than one medium, and a few remain in a single medium. They cross and recross media, change form, and have harmful effects in media other than into the ones in which they are first released.

It is now crystal clear that pollutants move for many reasons. Manufacturing plants, agricultural production, and other sources release pollutants into the air, water, and soil. Pollutants are intentionally moved among these compartments through the management of waste, including the removal of pollutants by air and water pollution control equipment.

Pollutants also move among media through natural processes such as leaching, and deposition pollutants may accumulate in places called sinks for long periods of time but then move again. People often are exposed to the same pollutants through more than one environmental compartment — by breathing, drinking water, eating food, or absorbing them through the skin. There is nothing novel in the concept that the environment is a system composed of air, water, and soil through which elements and pollutants cycle. But in the past we have not viewed the environment as a system, and our media-by-media approach has not been as productive as we wanted it to be. Indeed the U.S. system of environmental laws has grown piece by piece as understanding of the effects of human intervention in the environment has increased. There are now many pieces. Integrating them is a mind boggling task.

Because we have not had an integrated approach to environmental risk reduction, we may have added to the health problems confronting our populations. Allow me to cite examples of some of these problems and then identify some solutions which must be pursued in the 21st Century if we are to make further improvements in the environment.

The serious health and environment consequences from uncontrolled exposure to pesticides and toxic chemicals can be seen in a number of cases. The nation experienced contamination of food and ground water with the pesticide ethylene dibromide — a substance that was widely used to protect crops and stored grain until it was found to be a risk factor for cancer.

Today there is ample evidence of past buildups of pesticides in tissues of humans and in wildlife, resulting in the decline of birds such as the bald eagle and osprey. But we often forget that our homes, apartments, or condominiums contain all types of potential poisons, including:

- household cleaners
- paints
- furniture polishes
- wood strippers
- charcoal lighter fluids
- pesticides
- perfumes

Indeed our highest standard of living would not be possible without the thousands of different chemicals which are produced; most of these chemicals are not harmful if used properly. Others can be extremely harmful if people are exposed to them even in minute amounts. They may cause health effects ranging from cancer to birth defects and may seriously degrade the environment.

Even to the most casual observer of the health sciences there is a significant problem of birth defects. The National March of Dimes estimated that 10 to 15 percent of newborns have birth defects. Unfortunately, there are limitations on the data about reproductive and developmental disease. Some data suggest that one in four women will experience a miscarriage.

Are toxic chemicals a factor? The diverse nature of toxicants and the serious adverse health outcomes they can produce suggest that they and other environmental factors deserve serious regulatory consideration. Several hundred toxicants have been found to produce adverse reproductive effects in one or more experimental animals. In this context I should emphasize that human research linking environmental cause and disease is difficult, involving as it does three relevant parties:

- the mother
- the father
- the child.

Diagnosis is difficult because some physical or neurological problems are impossible to identify at birth.

Even with such uncertainties, birth defects are better counted and better understood than other reproductive and developmental diseases. To be sure the study of malformations is the oldest of the reproductive and developmental sciences. In terms of populations exposed, workers in industry and agriculture often experience substantially greater exposures to certain toxic substances than the general population does.

For example neurotoxic pesticides and solvents are common sources of exposure in workplaces. Neurotoxic disorders are one of the nation's 10 leading causes of work-related disease and injury. Like most environmental concerns, neurotoxicity is a problem that is not limited by national boundaries. Some scientists believe that neurotoxic substances play a role in triggering numerous neurological disorders such as Parkinson disease and Alzheimer's disease. Moreover there is scientific evidence that neurotoxic substances play a significant role in the development of some behavioral and psychiatric disorders. However, the extent of the contribution is unclear. Clearly everyone is at risk of being adversely affected by neurotoxic substances–fetuses, children, and the elderly.

Today more than 60 cities do not meet the federal air quality standard for ozone. Indeed air pollution is still one of the greatest risks to human health and to the environment in our country and in many foreign countries. The long list of health problems brought on or aggravated by air pollution includes:

- lung cancer
- bronchial asthma
- pulmonary emphysema.

Helping Los Angeles, New York, Houston, Chicago, Boston, Philadelphia, Baltimore, and many other urban centers across the country meet the health standards for low level ozone is a critical national goal.

But air pollution is not an exclusively outdoor problem. Six air pollutants — nitrogen oxides, carbon monoxide, radon, formaldehyde, asbestos, and passive tobacco smoke–particularly affect human beings indoors because their concentrations are often far greater inside buildings than outside. Since most people spend the bulk of their time indoors, these high concentrations may be causing serious human health effects.

There is another theme which deserves more attention in our environmental schemes designed to prevent disease, dysfunction and premature death and that is environmental equity. It is an *old* problem that has attracted *new* attention. Its "form" is evident: racial minorities and low-income people bear a disproportionate environmental risk burden. Few public health analysts would deny the fact that major sources of environmental pollution are more often than not located in communities heavily populated by racial minorities and low-income groups. This has been confirmed by numerous analyses, most notably a U.S. General Accounting Office study conducted in 1982-1983. This study found that in three of the four communities where off-site hazardous waste landfills were located, blacks were the majority of the population. In all four communities, at least 26 percent of the population had incomes below the poverty level, and most of the population below the poverty level was black.

In this setting it is difficult to ignore the fact that there are significant differences in disease and death rates between African Americans and whites. But how the combinations of environmental insults, economic and social conditions contribute to the health disparities remains less than clear. This state of our knowledge should not suggest that we simply do nothing to reduce the disproportionate pollutant burdens on racial minorities and low-income populations. Lack of clear and unequivocal proof should not impede corrective or preventive measures.

These then sketched in board outline are selected examples of environmental problems which must be high on a national agenda.

But many of us recall that in the late 1960s Americans began to recognize an emerging crises. We had witnessed serious environmental degradation in every medium. The air in many industrial cities was deemed unhealthy. Lake Erie was on its deathbed; pesticides like DDT took their toll on wildlife. In response to the environmental crisis the Environmental Protection Agency was created in 1970. Over the next decade and a half Congress passed a series of far-reaching laws.

Here at home we must continue to push a new national strategy for environmental quality. First we must recognize that pollution prevention should be a part of national health and environmental policy. In the early 1970s the federal laws prescribed needed changes in the way the nation conducted its business. It is fair to say that our society is now more aware of the environment and the need to protect it.

The United States has made significant progress in many, if not all, environmental areas where laws and institutions have been devised to address specific problems. But this progress should not obscure the fact that the job is far from finished.

In academia we must strengthen our environmental programs in higher and continuing education. University business and engineering schools and biological sciences programs must reexamine their curricula to determine if they fully prepare students to function in an era of environmental management.

So in the days ahead, we must summon the full measure of our power to achieve environmental results. In that effort we should be guided by what science tells us about the most serious threats to our health and environment and also by our knowledge of what works and what does not work. Our environment should be guided by a holistic view.

Our environment is composed of a seamless web of relationships between living organisms and the air, water, and land that surrounds them. Accordingly, rather than continue to address environmental issues in isolation from each other or from other social goals, we must expand our efforts to understand and protect the functional integrity of the environment–and our place in it.

We must emphasize again and again that environmental policy problems with few exceptions require interdisciplinary responses. But the way some of our academic institutions are organized (i.e., dominated by departments and discipline-based research paradigms) makes collaborative and interdisciplinary research exceedingly difficult. The resulting scholarship usually fails to provide adequate diagnosis or prescriptions for environmental problems as they exist full blown in the complexity of the real world. Our efforts to enhance the domestic environment must be accompanied by comparable efforts toward global environment.

In these times Americans are aware that our political and economic security are affected by actions occurring abroad. Likewise we know that environmental threats do not stop at lines on a map. In the months ahead we must continue to broaden our dialogue with other nations and international institutions and together address environmental issues that know no boundaries.

In conclusion we know that the causes and effects of environmental problems are diverse and complex. We should be humbled by the fact that the more we learn, the more questions arise. But unlike the situation a generation ago, we know today that environmental degradation can be halted and indeed reversed. But it cannot be done by government alone. Working together, government, private sector, and consumers can do much to ensure harmony between humanity and the environment.

Green vs. Greed: Development and Conservation

JOHN FERRARA
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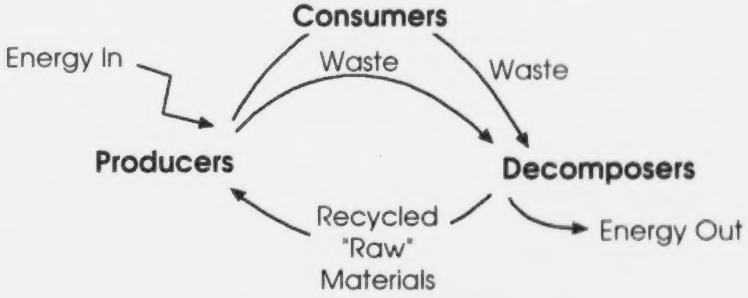
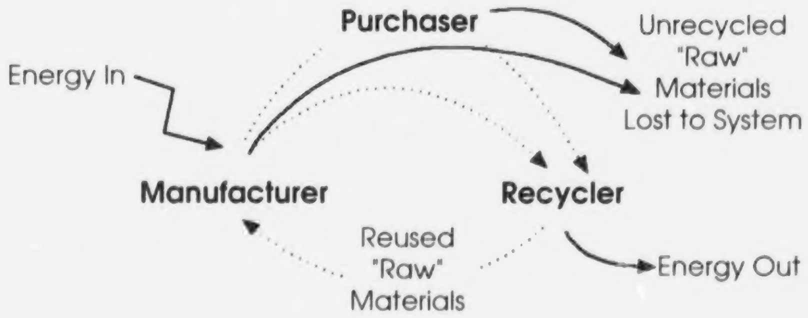
When the topic "Green vs. Greed: Development and Conservation" is presented for discussion, it tends to cause an instant reaction against development on the part of most citizens. Is this the correct response or should we develop our reaction after gathering more information? I believe you know the answer to the question which is based upon scientific explanation or even more on "tacit knowing" that Michael Polanyi refers to in *Science, Faith, and Society* (1946). Ultimately we know what is right and wrong. The difficulty arises in selecting the correct path.

Development means to make more open, more usable while conservation means to preserve, to keep hands off. In reality we are addressing the basic interplay between matter and energy when deciding whether to develop or to conserve. In a "natural" system matter recycles in the system while energy passes through and exits the system.



Matter in this system obeys the Law of Conservation of Matter (Second Law of Thermodynamics): matter cannot be created or destroyed, but can change from one form to another. Energy obeys the Law of Conservation of Energy (First Law of Thermodynamics): energy cannot be created or destroyed, but can change from one form to another. Where does the matter come from? It is here on this planet and there is no new input of matter. Energy, however, arrives anew from the sun in a constant stream and eventually exits into space. What we have done and can label as "development" is to change the "natural" system into a "consumer-based" system.



Who's to blame for this situation? We are quick to point the finger of blame at the petroleum industry, the chemical industry, the electric industry, the steel industry, etc. But who among us here in Cleveland, Ohio, doesn't ride in a motorized vehicle, or eat food, or have electricity in our homes? Turn the finger and we point at ourselves. Would you be willing to go back in time and live as our ancestors did in the 1600s? I think not.

But how do we solve this circular puzzle? It will take a collective effort like never seen before. People throughout the world are going to have to learn to share what they have in exchange for what they do not have. Perhaps we need not cut down the rain forest if renewable timber from the temperate zones was used and bartered for something like copper. "Copper mining is development and destructive," you might be thinking. You are correct, but if we are to consume things, then we must develop some of our resources. The key lies in developing resources with as little environmental impact as possible. Take only what is necessary and return the area back to as natural a state as possible. Yet, we must also realize that there are areas that must never be touched. They are so unique or important that they must remain natural. Encourage growth of the recycling industry worldwide. We bury too many natural resources in landfills and then build on them. These natural resources are then lost to our consumer-based" system unless you which to raze a neighborhood to dig up a bunch of steel cans. We are not powerless to help, but we will become powerless unless we accept that we are a major part of greed (development) and need to become a greater part of green (conservation). Perhaps the most telling quote was uttered by the character Ian Malcolm in *Jurassic Park*: "Let's be clear. The planet is not in jeopardy. We haven't got the power to destroy the planet or to save it. But we might have the power to save ourselves."

Plants and People: A Developing Relationship

ALAN SHATTEEN
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Throughout our lives the majority of us have paid scant attention to the essential importance of the plant community which cohabit with us on this great planet earth. Our daily life experiences with plants can and do play a key role in our health, personal well being, and overall quality of life. Many of the most important materials we use, the nutrients we consume, the fuels we burn, are all related to plant life. My focus here is to relate the importance of maintaining a viable plant community within our man-made environment. The benefits of that relationship accrue not only in the form of oxygen production, as evidenced by the ongoing cry for restraint in the depletion of the South American rain forest, but more importantly these benefits which can be found right in our own backyard.

The precursors of major trends are often found in the subtle but distinct changes which occur within nature. These quiet occurrences are today finding voice in the community of scientists, environmentalists, and a growing cadre of psychologists, sociologists, and physiologists who have noted profound changes in the health and well being of people who have pursued and developed relationships with our overlooked companions in the plant community.

In addition to offering a historical perspective, our review of these trends will include a look at the rise of personal gardens, the effect of community gardens on the collective well being, and horticulture as therapy.

Historical Perspective

The production of crops is at the very basis of our human civilization. The inability to produce food resulting from natural and man-made disasters has shaped the very development of our world. The incidence of famine caused by a decline in productive capacity or by changing sociopolitical environments has contributed to the death and debilitation of millions of people throughout the history of mankind.

Agriculture is said to have developed as a viable means of food production through a series of inventions probably beginning with the discovery of basic methods of propagating vegetable crops and or the use of seeds. Over time and through the development of consistent cultural practices, agriculture became and has remained a dependable source of food production.

As a result of the industrial revolution we have been able, through the use of mechanization and chemistry, to produce a surplus of food throughout the developed world. The current challenges we face in overcoming food shortages in our world do not lie within the ability to produce but squarely within the arenas of poverty and politics.

We are now poised to redistribute portions of the population in space. As a result of our near space excursions, we have again discovered that, in order to survive in the distant reaches of outer space, we must rely on the plant community to provide our sustenance, remove carbon dioxide, release oxygen, and recycle our waste. The community of mankind is inextricably linked with the plants we often take for granted.

The Rise of the Personal Garden

Gardening as a source of personal well-being can be most readily observed right in our own back yard. By now our plans have been made, the seeds purchased, and in some cases started in indoor containers. Spring is never very far away. We make sizable investments of human spirit when we decide to sow a seed or grow a plant. We create mental expectations of how the garden will appear in its final form, and then wait patiently for the fruit of our labor. The ultimate quality of the person-plant experience is a function of the amount of personal involvement and success of the horticultural project. Throughout this process we may experience the full range of human emotions.

From the human perspective the strength of gardening lies in nurturing. Caring for another living entity is a basic quality of being human. The deep personal feelings brought forward by this nurturing is recorded in our brain as part of the gardening experience. There are many aspects of the process of gardening that are profoundly important in their ability to create human well-being. The feelings created in people by plants are often so subtle that they are overlooked. In order to more fully understand the personal meanings of plant-people relationships, we must look beyond the physical and into the next level of consciousness.

Community Gardens and the Collective Well-Being

Over the past several years gardens in disadvantaged areas have produced a history of healing and growth. Community gardens have been shown to have a significant impact on the quality of life within the urban environment and represent a significant element in the renewal and development of in-city communities. In 1962 the New York housing authority initiated a tenant gardening competition. The results of this program and others throughout the country are appealing.

In attempting to explain the cleaned streets, reduced vandalism, painted houses, and new sense of neighborliness, Dr. Edward Stainbrook of the University of Southern California School of Medicine wrote,

> An environment of ugliness, dilapidation, dirtiness, over-built space, and a lack of natural surrounds confirms the negative self-appraisal a person may have developed through contacts with society. Self-esteem is the keystone to emotional well-being; a poor self-appraisal, among other factors, determines how one treats his surrounds and how destructive he will be toward himself and others. These factors set up a vicious circle that is difficult to break. (Stainbrook, 1973)

The process of gardening enhances self-esteem because the gardener takes on a responsibility when growing a plant. The future of the plant is directly dependent on the gardener's ability to produce favorable conditions for its growth. Each day as the garden is tended the growth of the plants can be observed and the rewards of nurturing received in the form of new leaves, stems, and flowers. A personal relationship is built with the garden which becomes an extension of the gardener–a visual representation of personal achievement.

What are the qualities that plants engender which encourage people to respond to them? We know that plants are alive and very dependent. They are non-threatening, non-discriminating, and non-judgmental. They respond to the care given them and not to the race, intelligence, or physical capacity of the gardener. Plants will grow if given proper care. They can be the setting within which a person takes the first steps toward confidence and self-esteem.

Horticulture as Therapy

Horticultural therapy has been defined as the sharing of the experience of plants between the therapist and the patient/client. Their interaction creates an environment which is beneficial in mediating patient/client dysfunction because plants are universal to the human experience and symbolize an ordering of human life with that of the nature. Originally academic programs in horticultural therapy trained students to work in the mental health field with principal placements within that field. Today at least six specializations are offered in the areas of community-based programs, gerontology, corrections, developmental disabilities, special education, and mental health.

The dynamics of a horticulture therapy program have been outlined at the Menninger Foundation in 1978 by Dr. Ira Stamm and Andrew Barber and includes specific ego functions and experiences which occur during the process of gardening:

1. Planning: This step involves deciding what should be grown, the timing and scheduling of the plant, and the sequencing procedure.

2. Preparation: Working the soil, getting tools together, and starting the process requires involvement and anticipation of things that will happen.

3. Measuring: Linear relationships, volume measurement, and counting skills are required to plant a garden or to transplant a seedling. These activities involve use of the analytical left hemisphere of the brain.

4. Regularity: Nurturance and continual care are required on a regular basis in order for plants to survive.

5. Creativity: The artistic aspects of horticulture allow clients to be individualistic, self-expressive, and aware of the universal language of flowers and plants.

6. Impulse management: Delaying gratification is a skill to be learned in the garden. It takes time for a plant to germinate, grow, develop, flower, and produce harvestable fruit.

7. Anxiety and tension reduction: Through physical labor a client may be able to reduce tension and fear.

8. Response to success or failure: If the harvest is good, does the patient consume the product, sell it for profit, or save it for a rainy day? If the harvest is a failure, does the patient externalize the blame onto the weather, the therapist, or his/her peers?

9. Frustration tolerance: Learning to live with the unexpected is another lesson taught in the garden. Invasions of insects, diverse weather, and other uncontrollable events can frustrate a gardener.

10. Response to basic instincts: "Foremost, horticulture touches on life and death and the broad repertoire of human emotions that life and death stir in all of us. In between the beginning and end of life is a phase of growth and decline, of developing new capacities and skills and losing them with age. The issue of nurturing life, or caring for it and ministering to it in health and in illness,

through good times and bad, are emotions and feelings experienced by all of us. The experience the patient has with the plant world can be a microcosm for the experiences in every day life." (Stamm & Barber, 1978)

Summary

The ability of gardening activities to heal and help us grow has been recognized since the beginning of civilization. As therapy, gardening has assisted many in restoring health and well-being from the quiet view of a garden to the beneficial exercise one derives from tilling the soil. Our relationship with plants produces a focused interest which normally serves to remove stress produced by a fast changing world. This sensual relationship is greatly enhanced as we more fully experience the sight, touch, taste and smell of the plant kingdom. Plants are not only a source of well-being, but are essential to our continued existence.

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Forests Dying - Cultures Crying

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For a long time I have been involved with cultural diversity and sharing how we, of many cultures, celebrate our human spirit's rites of passage: birth, coming of age, marriage and death. Yes, I've often urged the audience in this forum to participate in my Intercultural Communication Class. Thus, again, I responded to the symposium organizers with, "Wonderful, I shall speak of cultures."

The response: "No, the environment."

"Fine," I replied, "Cultural and minority environment."

"No, the environment that envelopes us. We're preparing environments for the 21st century."

And then it clicked for me, I've trekked and loved the tropical rain forests in the A's–Africa, Asia, Australia, and America–and I assumed, like any good love affair, they would always be there for me–for my body, the gift of herbal medicines, providers of life; for my soul, the pleasure of wooden creature comforts, house and furniture, and life's art form delights; and for my spirit, as a haven of mystic peace.

I'm involved with cultural traditions. I better well be concerned with the environment in which we live. It is self evident that each of us and our earth are inseparable. Let's listen to very different voices with the same message. John Muir, the great naturalist and conservationist who in 1890 influenced the U.S. Congress to pass the Yosemite Park Bill, said, "When we try to pick out anything by itself we find it hitched to everything else in the universe." And more recently, the last man who stepped on the moon, Eugene Cernan from Portland, Oregon, proclaimed, "I don't see my city. I only see the world." We must all feel the rhythm of the earth. Igor Stravinsky, commenting on his composition *The Rite of Spring*, stated, "I want my music to reflect man's relationship with the earth.

The biological richness of the forest is its main asset. There is staggering diversity. A typical square mile patch is a cornucopia: 1500 species of flowering plants, 750 of trees, 400 of birds, 150 of butterflies, 125 of mammals, 100 of reptiles, and 60 of amphibians. Our closest relations–from the mountain gorilla in Rwanda, Africa, to the orangutang (orang-utang, people of the jungle) in Sumatra and Kalimantan (Borneo) in Indonesia to the marmoset monkey in the Americas–are all endangered species. But only a notch away from man.

The forests are dying. Every second we lose an area the size of a football field. Every minute we lose an area the size of 10 city blocks. Every day we lose an area the size of Pennsylvania. Need I go on? The destruction is advancing at a mind boggling pace.

Human beings are Johnny-Come-Lately's on this earth. Still, for thousands of years, rain forests have been home to forest dwelling people who have developed rich cultures while being in harmony with the environment. An Amazon proverb states, "The Gods are mighty, but mightier still is the jungle."

The cultural erosion in the tribal communities throughout the tropics is as serious a problem as the loss of the rain forest itself. The medicine men, the shamans, are dying. We lose with them the knowledge of the forests because the young men and women of the tribes either have no ancestors from whom to learn the traditional ways or are disinterested. It is rather like the old song that begins, "I speak to the trees, but they don't listen to me." When we lose the harmony of that music, we lose all.

Forty percent of the closed forests have been decimated, cleared, or logged. (Closed forests receive at least 79 inches of rain a year, producing a broad-leaved evergreen canopy so dense that grass cannot get enough sunlight to grow underneath.) Why did this ravaging deforestation begin? Rising population pressure was a major force. How to survive? It was necessary to provide a safety valve for the landless poor. With government assistance, forests were cleared for highways, roads and farms to create a "new frontier." In Brazil alone over a nine-year period, 28 million acres were cleared. Yet the irony: the soil is poor and it was common to see settlers give up their clearings after the first meager harvest.

In Indonesia, imagine, less than 2% of the island's tropical rain forest soil is cultivatable. Yet millions of Javanese have transmigrated to outer islands in search of a better life and have attempted to Javanize the indigenous people, destroying their lands, culture, language, and religion.

Also, almost 70% of the people in developing nations are wood gatherers, using it for necessary heating and cooking. Concomitantly, developmental projects such as Tucurui Dam, the hydroelectric project in northern Brazil, flooded 800 square miles of the forest and along with it went the indigenous people.

Now, cattle ranching rather than farming is satisfying the hamburgerization of Central America. Two-thirds of their forests have already been cut. Yet after 10 to 15 years overgrazing causes the cattle rancher to move on. I dislike plying you with statistics but the figures I share are overwhelming.

Another culprit is commercial logging. The world's consumption of all kinds of commercial timber is proceeding at an official rate of almost 17,000 square miles a year. And that doesn't include illegal harvesting.

You may ask, why should I care? I live in Ohio, not the Amazon, not Africa, not Papua New Guinea, not Australia. Many scientists, along with other concerned individuals, are alarmed; they believe that saving the tropical rain forests, our turf, is one of the most important issues of our time.

Think of it. The benefits of the forest are not limited to the inhabitants. Developed nations import billions of dollars annually in tropical timber, rubber, fiber for clothing, nuts (Oh, those Brazil nuts!), and more essential–healing medicines.

Traditional healers reportedly use an estimated 65,000 plants in treatments for malaria, stomach ulcers, and syphilis. Scientists have learned how to use many of these plants in modern medicine to treat headaches, skin irritations, diabetes, cancer, high blood pressure and heart disease, to name but a few.

For example, one of the important drugs that we use today in heart surgery was discovered in use among rain forest peoples as a poison for the tips of arrows. Then there is a vine that is used to produce cortisone for the treatment of rheumatoid arthritis and rheumatic fever, among other illnesses. Roughly one in four drugs purchased in a pharmacy today owes its origin in some way to a tropical plant or animal. In 1980 alone the U.S. imported $20 million worth of medicinal plants to produce drugs worth $8 billion commercially.

But, our breath of life is at stake. When a tropical rain forest is burned, releasing carbon dioxide into the atmosphere destroying our protective layer, the planet warms up, with very negative climatic implications. Last Christmas, a scientist guided me through a forest in Costa Rica. He gently touched a leaf on a tree and explained that the loss of just one leaf in a tropical rain forest is equal to the loss of several trees in a temperate zone. And with that loss, the loss of oxygen–the loss of our breath–the loss of our life.

What hope? What can we do? Knowing means more than just knowing. It means knowing to act as well. How do we translate vision into reality? Efforts around the world include creating: 1) educational programs; 2) parks and preserves; 3) multiple use reserves; 4) self-help innovations; 5) preserving cultures and their wisdoms; 6) ecotourism; 7) laws and policies; and 8) utilizing art as message.

Where is the action? Education is the first line of defense. Our schools, from primary to higher education, are involving learners in awareness activities. Just think, even I have become an evangelist for survival. You can learn in an armchair, learn in a classroom, and at the rain forest in the Cleveland Zoo. If possible, travel to a rain forest for the sheer joy of a life-giving experience. Then, spread the word!

Do join one of the wide range of environmental groups; for example, there is a Cleveland chapter of the Sierra Club. Do recycle and refrain wherever possible from purchasing products that are from endangered species. But you have heard all that before.

One environmental organization, Conservation International (CI), has created many successful programs. One is Debt-For-Nature Swaps. As the name implies, they induce banks and other organizations to donate debts to conservation projects. They have helped reduce tropical countries external debts by 100 million dollars, while providing major funding for conservation initiatives around the world.

Another CI innovation is the Seed Ventures Tagua Initiative, harvesting and marketing non-timber products and thus promoting conservation and simultaneously creating jobs.

Another good idea, Biosphere Reserves, were first promoted by the United Nations Educational Scientific and Cultural Organization (UNESCO). These reserves comprise zones of concentric rings, each with specific restrictions. The core is to be unviolated; the second zone is for gathering of medicinal plants and wild food by the tribal people; the third zone is restricted for local families to farm and collect wood; and the outer ring may have houses, hotel rooms, and roads. The tribal families living in the third buffer zone serve as guardians of the reserve.

The Kuna Indians in the San Blas islands off the coast of Columbia, in an effort to prevent deforestation of their own land, have declared a large part of their tribal territory to a nature reserve. They have hired scientists and park planners to watch over the first park in the world that was created by a tribal group. They have labeled the trees both in Kuna and Spanish and have successfully invited research scientists and ecotourists who pay for the privilege of using this natural laboratory, thus stimulating the economy as well.

Dr. Mark Plotkin, Vice President of Plant Conservation at CI, worries about cultural erosion and has started a Sorcerers Apprentice Program, creating harmony as in Dukas musical composition of the same name. As the sorcerers (the shamans or medicine men) disappear, his goal is to record ethnobotanical knowledge and then protect the useful species. This is done, first, to insure that the ancient lore is kept within the tribe and, second, to raise awareness among indigenous peoples and the rest of the world that conservation can be a powerful means of preserving both their culture and their home.

And of course, let's not overlook legislation. Land reform laws have taken place and policies continue to be established. One proposal is the creation of an Organization of Timber Exporting Countries (OTEC), like the Organization of Petroleum Exporting Countries (OPEC). Also, the U.S. Agency for International Development (US-AID) is increasing American involvement. The World

Resources Institute proposed a five-year, eight-billion dollar plan involving land planning, reforestation, and conservation research. Let us hope that research reaches reality.

One potent message-sending system is art. For decades, Frans Krajcberg, a Polish immigrant to Brazil, living alone in the forest, angrily railed against seemingly endless devastation and was dismissed as an eccentric. Now his sculptures, utilizing purchased tree trunks with roots and vines, his "Skeletons of the Forest," are presently in an exhibition entitled "Images of Fire" that shuttles to major museums of the world. He is now Brazil's adored and highest paid artist. Almost overnight his "art of denunciation" has been embraced by the establishment. Now Brazil is building a six-million dollar Krajcberg Foundation, an arts and environmental education center to house the artist's collection and promote his ideas.

We've come full circle. We begin and end with education. A recent investigation has indicated that it is economically sound not to cut down trees for timber. The profit is only one-third of the cost of cleaning the pollutants that have damaged the environment. No business person would tolerate that return. We need to have a moratorium on destruction, like a nuclear test ban treaty, until we have time to acquire even more knowledge on how to use the forest constructively.

The alarm has been sounded. We must join in the race, and run in the same direction to save our planet. Please pick up a Conservation Action Checklist. Without our concerted efforts we will lose bird song, lose traditional cultures, and may or may not watch their death rituals. These are masks worn to celebrate the last rite of passage–Death. Forests die, Cultures cry–But if Forests Survive, Man Alive! A Chinese proverb reminds us: Only when you will love the TREE like yourself will you survive.

Adoption of Community Water Supply in Three Villages in Muhafizat Kafr Al Shaykh, Egypt

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Preface

Data collection for this project was made possible by a generous fellowship from the Shell Oil Foundation. The village interviews were conducted during the months of June and July 1985 by seven courageous Egyptian women whose indefatigable care and concern leave a permanent imprint on the quality of this research.

The researcher further wishes to thank the following Egyptian Ministries: The Ministry of Foreign Affairs, The Ministry of Education –The Office of Cultural Affairs, The Central Agency for Public Mobilization and Statistics, and the Governate of *Kafr Al Shaykh*. The American Research Center Egypt extended me fellowship status and was instrumental in making a myriad of necessary arrangements as well as encouragement.

Furthermore, I would personally extend my thanks to Drs. Mark Kennedy and Nicholas Hopkins of the American University Cairo Anthropology/Sociology Department.. Dr. Mauracy Saad El Din and Dr. Shahinaz Talaat were instrumental in their suggestions and help. Dr. Peter Van Arsdale, Dr. F. Floyd Shoemaker, and Dr. Everett M. Rogers, members of my Ph.D. committee, provided guidance and inspiration when the chips were down.

Finally, my family and my wife, Norma, to whom the ultimate measure of gratitude must go for her sacrifices and love which carried this project from a dream to reality.

The Study: The research project outlined in this preliminary paper is a diffusion of innovation field study. It examines the adoption behavior of mothers and daughters regarding protected community water supply in three villages. These villages are located in the Egyptian governate or province of *Kafr Al Shaykh* in the upper Nile Delta.

This study joins a tradition of diffusion studies embracing many different disciplines but linked together beneath the communication disciplinary umbrella.[1] The present research project relies upon the use of anthropological, communication, geographical and sociological techniques to understand those factors influencing drinking water gathering from protected public taps as a public health innovation. The importance of this study is highlighted by the severe consequences of non-adoption or the continued reliance upon irrigation canal water as a source of drinking water. This practice of ingesting canal water impacts the hardest healthwise upon the most vulnerable segment of the village population–namely, the infants and children. This is so perhaps because they possess the least resistance to the harmful elements contained in this polluted water. All too often this exposure leads to several forms of acute diarrhea,[2] which end in dehydration and the subsequent death of the child. A recent study conducted by a joint team of Egyptian and American scientists in the same Nile Delta area concluded that the most frequent microbial culprit was a protozoan parasite *Giardia lamblia* in 44% of the examined cases. One of the chief ways by which giardiasis, as the disease is called, is transmitted is by drinking fecally contaminated water.[3]

Historical Sketch of Egyptian Rural Drinking Water Research

One of the earliest studies of Egyptian village drinking water use was undertaken in 1939 by an Egyptian social worker Mohamed M. Shalaby. His five-year study *Rural Reconstruction in Egypt* was published retrospectively in 1950. It is a single village study of the village of El Manayel just outside Cairo. At that time it had a population of 1,600 people. Shalaby observed,

> In many other villages the government had developed new systems for healthy water supply but they were not used properly because the people still thought the water from the Nile was the best for drinking; why not, it was sent by "Allah." The fellaheen (peasants) of El Manayel were not different from others. They did not accept the idea of change easily. . . They believe in Allah who sent this water. Allah never wished them harm. They never liked water from wells. They feel weak when they drink it. "It is saline and unhealthy," they believe.[4]

His answer to this problem was to organize a health education campaign with the assistance of a nurse and physician.

Another early study was done under the auspices of the World Health Organization in 1951 by Robert Bogue and Aziz Habashy and published in 1952 as *Health Education Project in Three Villages in Egypt*. The study villages are in the Nile Delta adjacent to the city of Tanta. Four observations were made:

> 1. The canals are the main source of water from Pharaonic days; 2. Pure water supplies are not found in all villages; 3. The taste of canal water is more pleasing to the fellaheen than artificial supplies; 4. There is a belief that canal water gives fertility to both sexes.[5]

They found that direct contact with the village woman was the best method of health education.

The next significant study was done 25 years later by F. Dewolfe Miller, Ph.D., from the University of Michigan School of Public Health in 1976 and published in 1978. The report is entitled *Environmental Data From Rural Egyptian Villages*. It is a national study which included the governate of *Kafr Al Shaykh*. Five hypotheses were developed to explain continued use of irrigation canal water by villagers despite the presence of protected water. These hypotheses were as follows:

> 1. Some *Kafr Al Shaykh* women like to socialize at the canals; 2. Some canals are closer than the stand pipes (applicable to those who do not have indoor piped water); 3. The piped water may taste bad from time to time due to chlorination; 4. The piped supply may not be continuous; 5. When stand pipes are crowded water may be more conveniently obtained from a canal which is relatively close by.[6]

These hypotheses were not tested by him. His overall solution to this problem was to call for increased availability of public stand pipes.

All of these research projects dealt with a number of different environmental health factors and did not, as this project does, focus on drinking water. The common unit of analysis employed was observation which is important but limited in its value. No attempt was made to systematically elaborate and analyze all the factors involved in the adoption process.

Background of Situation

Egypt is a developing nation beset by a burgeoning population of over 50 million. It is estimated that by the year 2000 the population will reach approximately 60 million. Roughly 57 percent of its total population, almost 21 million people, live in villages ranging in size from less than 2,000 people to more than 10,000. These people in 1978 were being given health care at 2,081 clinics.[7]

In the face of its mounting population growth, some one million children born every nine months, Egypt has undertaken ambitious programs of land and water management to make maximum use of the country's agricultural resources. The agricultural sector carries the economy by providing surplus value, domestic buying power, and foreign exchange earnings.

The fatalism of the poor is generally expressed in their submission to the will of God. This reflects the material reality of peasant life: subsistence economy, natural disasters, disease, high infant mortality, and early death. What needs changing is the socioeconomic situation in which the religion is practiced. Since disease is a prominent problem plaguing the poor people of the villages, and since their role vis-a-vis supporting the national economy is great, a program that would better their health environment would eventually help the nation as a whole by increasing its labor productivity. One of the foremost epidemiological relationships to be demonstrated between environmental factors and health has been the one between water-supply and water-related diseases (80 percent of all disease is water-related). Among these, diarrheal diseases are listed as the foremost cause of death.[8] Diarrheal diseases also play a role in the cycle of malnutrition and infection which weakens and often results in high mortality rates among young children.[9] Village Egypt, of course, suffers from the ever-present schistasame infestation. The research undertaken here looks at the problem of under utilization of available protected water supplies. It also examines the variables affecting adoption in one village where a protected source of water is as yet unavailable. Basic consideration is given to values, conceptualizations and traditions of the villagers as they influence or shape the perceptions regarding protected water usage.

Finally, this research links together with the Egyptian government's ongoing socioeconomic plan aimed at improving health conditions for a major portion of its populace and also for improving the agricultural productivity of its village inhabitants. It also coincides with the *United Nations International Water Supply Sanitation Decade (1980-1990)* in which a special effort is being made to overcome the lack of adequate water supply and sanitation in the developing world.

Research Procedures and Methodology

The field research design used relies upon a non-experimental cross-sectional controlled comparison approach. Mothers and, in some instances, daughters as water gatherers and potential adopters were evaluated in three villages during the same time period.

The cross-sectional approach implemented had three advantages:

1. Since all observations were made within a restricted time period, there was no problem of changing conditions.
2. Casts were reduced because of lowered logistical constraints allowing the data to be collected quickly and easily.
3. The design is useful for a synchronic observation study like this one.

The controlled comparison component of this method refers to examination of regularities in the distribution of selected traits among a limited number of units within a single geographical area–in this instance the province of *Kafr Al Shaykh*. This insured that observed variations were not due to geographical, cultural, or socioeconomic differences. In this manner, irrelevant social variables were minimized. Other examples of constraints imposed were the size of the village population, from 2,000 to 6,000 people, and the village's distance from its primary unprotected water supply.

Villages meeting all the anticipated requirements came down to a short list of 15. On-site visits were made to each of these villages and unstructured interviews with women gathering water were taped. All three selected villages differed as to the availability of protected water. For instance, the village of *Al Belsheshah* had a recently installed community water system with five stand pipes and some under construction, while the village of *Al Edraygh* had an older system with only one standpipe which during summer months had sufficient water pressure only from midnight to 6 o'clock in the morning. In this village water was accessed from private taps with manual or electric pumps used to increase water pressure. Those lacking this facility used their neighbor's, travelled to an adjacent village, or were forced to consume canal water. The third village of *Al Hasafah* had no source of protected water and was wholly dependent upon canal water as its only source for water. This water was available in four-day cycles, where for four days there was water in the canals and then for four days none. This village was included as a pre-innovation or pre-adoptive village in order to gather villagers' perceptions *qua* perceptions before the installation of piped water.

Data collection was done by seven Egyptian college graduated women using an 84-page Arabic interview schedule containing both scaled and open-ended questions to permit quantitative and qualitative analysis. Maps were drawn to measure the effect of distance on adoption. They were all trained in the technique of standardizing their interview approaches and how to handle anticipated situations. These same women along with the researcher painted numbers on every house in every village to make a random selection possible. If a mother was busy and a daughter who gathered water was available, then she was interviewed. Under no circumstances were interviewees forced to participate. Pre-tests in a different village were carried out and gave a chance for interviewers to practice their newly acquired skills.

Factors Influencing the Adoption of Protected Water

1. Village social preconditions.
2. Socioeconomic status.
3. Perceived social support.
4. Community participation.
5. Awareness of and knowledge about protected water.
6. Knowledge about and attribution of good health to protected water.
7. Perceived feasibility.

8. Perceived concern about risk.
9. Perceived relative advantage.

Dependent Variables

1. Position toward protected water.

2. Adoption.

Figure 1: Independent Variables

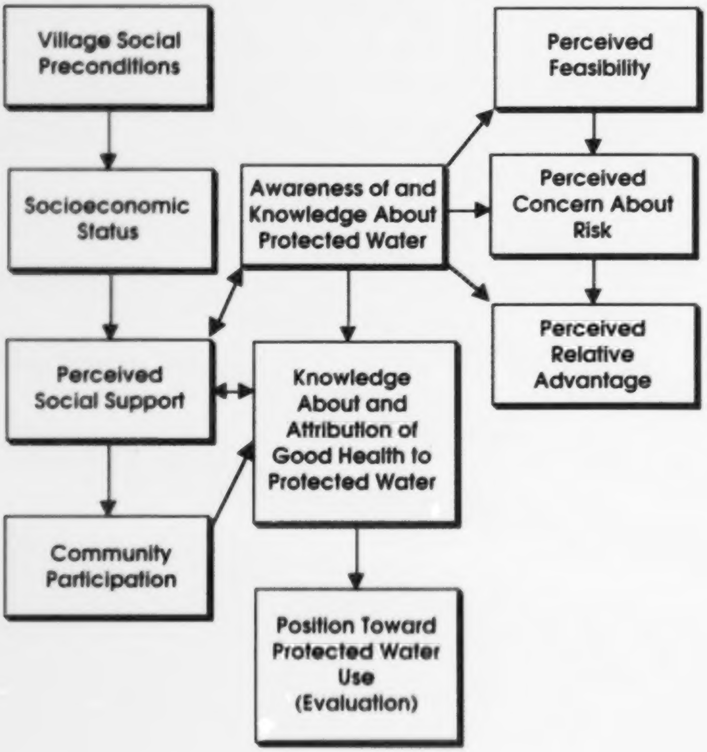
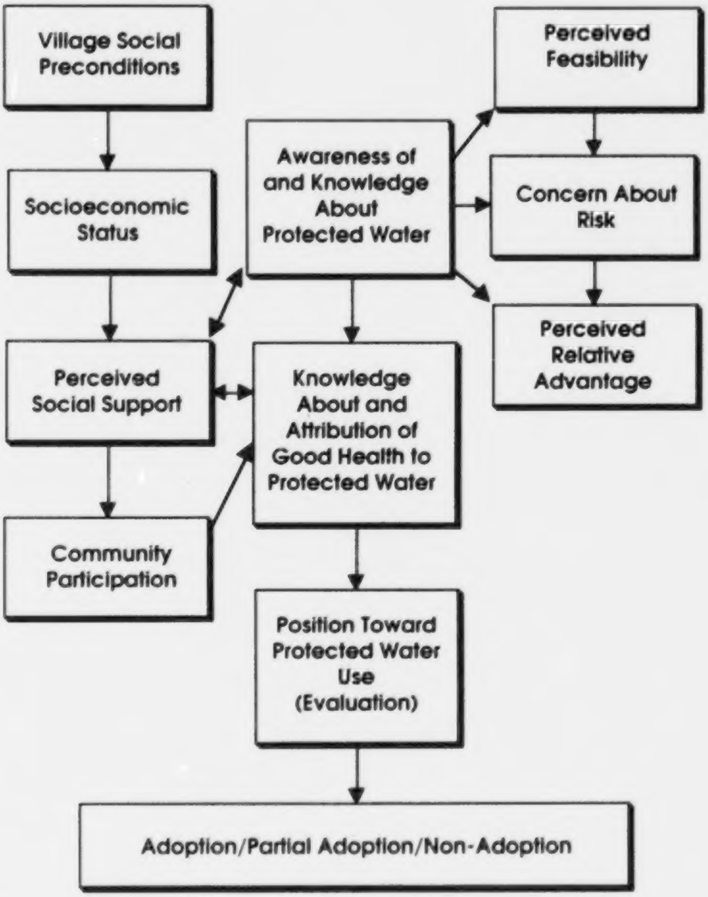
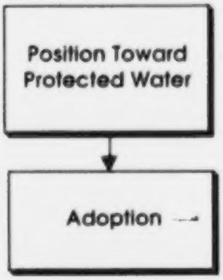

Village Social Preconditions
Socioeconomic Status
Perceived Social Support
Community Participation
Awareness of and Knowledge About Protected Water
Knowledge About and Attribution of Good Health to Protected Water
Position Toward Protected Water Use (Evaluation)
Perceived Feasibility
Perceived Concern About Risk
Perceived Relative Advantage

Figure 2: Conceptual Model - Egyptian Village Drinking Water Study


Village Social Preconditions
Perceived Feasibility
Awareness of and Knowledge About Protected Water
Socioeconomic Status
Concern About Risk
Perceived Relative Advantage
Perceived Social Support
Knowledge About and Attribution of Good Health to Protected Water
Community Participation
Position Toward Protected Water Use (Evaluation)
Adoption/Partial Adoption/Non-Adoption

Dependent Variables


Position Toward Protected Water
Adoption

The independent variables either increase or slow down the innovation adoption process and effect where people are positioned on the innovation-decision process model.

The model's stages include the following:

1. Initial Awareness
2. Knowledge Evaluation
3. Decision-Intention
4. Action (Adoption)
5. Observation of Effects
6. Continuance/Discontinuance Decision

Village Social Precondition

This concept refers to social practices which either act as social incentives or social barriers to adoption. An example of a social barrier is the village practice of storing water in an earthen container called a *zir*. It is a folk belief that the *zir* filters the water making it clean. In reality, quite the opposite is the case since the *zir* lacks a proper lid and air carries bacteria and dirt into it which multiply in the heat. This belief detracts from the need to seek out and use protected water.

Socioeconomic Status

Socioeconomic status refers to the relative economic well-being of the potential adopter's household. The greater the degree of wealth, the more likely the person will adopt. This includes such measures as education level, occupation, size and construction of the home, etc.

Perceived Social Support

Is the water supply system compatible with the ways of life in the village? Is the innovation seen as consistent with the existing values, past experiences, and needs of potential adopters? Do women see other women making regular use of the standpipe? People are influenced to adapt new ways of doing things on the basis of what others say. Should an authority figure, opinion leader, or close friend favor the use of public tap water, that person is more likely to use it.

Awareness Of and Knowledge About Protected Water

Those people with the highest degree of exposure to radio and television adapt earliest. These are villagers who have been exposed to the government's media campaign presentations on why they should always use clean water.

Knowledge About and Attribution Of Good Health to Protected Water

If people have a basic knowledge of health and know that drinking dirty water is a cause of disease, they are more likely to adopt. These people know the causal link. Many villagers think from a folk wisdom that Allah, not microbes in the water, causes disease.

Perceived Feasibility

It is the belief in the efficacy of the innovation. Performance expectations and reliability are expressions of this concept. Belief that a standpipe would be a good source for drinking water. Many village water supply systems in the Nile Delta are recognized to lack reliability due to mechanical and water pressure problems. This would mitigate against a favorable evaluation.

Perceived Concern About Risk

In the villages women speak about fights which occur at the public taps due to long lines of women waiting to use them. Rather than risk an altercation with another woman, some women resort to using the canal. Similarly, some women claim they dislike the type of women they meet at the tap. The greater the risk, the less likely adoption will occur.

Perceived Relative Advantage

Is it easier to take one's water supply from a tap or from the canal? This can be measured in the distance of one source as compared with the other. Can the standpipe water serve multiple uses such as washing clothes, utensils, pots and pans, etc.? Does it provide a consistent source for water that tastes good? Many villagers dislike the taste of the chlorine.

Community Participation

This is a measure of the extent to which potential village adopters are involved in the planning, implementation and maintenance of the protected water system. The greater the degree of involvement or intended involvement, the more likely adoption will occur.

Types of Data Analysis Employed

1. Ethnographic Case Study.

The individual case study is examined through the use of the written record of the respondent's replies to the interview schedule questions. This in turn is supplemented by the use of tapes made of some interviews. Ranked and open-ended questions permitted a wide range of responses to be recorded. This adds a certain depth to the data. Additionally, tapes were made of unstructured interviews with women at the canals.

2. Thematic Content Analysis.

Here the open-ended responses examined for recurrent themes as a means of content analysis. In the beginning, there were some 30,000 responses. These were reduced to 1,300 categories and, in turn, these were reduced further still. Each response category is expressed in a percentage of women who gave a like response. It is a way of viewing the people's opinion in an aggregate fashion. One particular aspect of this technique was input into the structural equation model. These were response categories given by the women regarding the cause of disease. A pattern of either "Allah" or western scientific explanation was apparent. This data from a number of question responses became a score which was used in the model.

3. Observation.

The researcher spent many hours watching where people took their water from and how they used it. In this way, it was discovered that the only standpipe in the village of *Al Edraygh* did not function properly. A young daughter stood in front of the public tap sucking on the faucet with all her strength and when same water would start to flow, she would quickly position a red plastic bucket underneath to catch whatever water she could while spitting out the overflow in her mouth. In this manner, over time she was able to fill her bucket. This observation lead to questions which, in turn, led to the discovery that the one tap was functional during the night only in the summertime.

4. Structural Equation Model

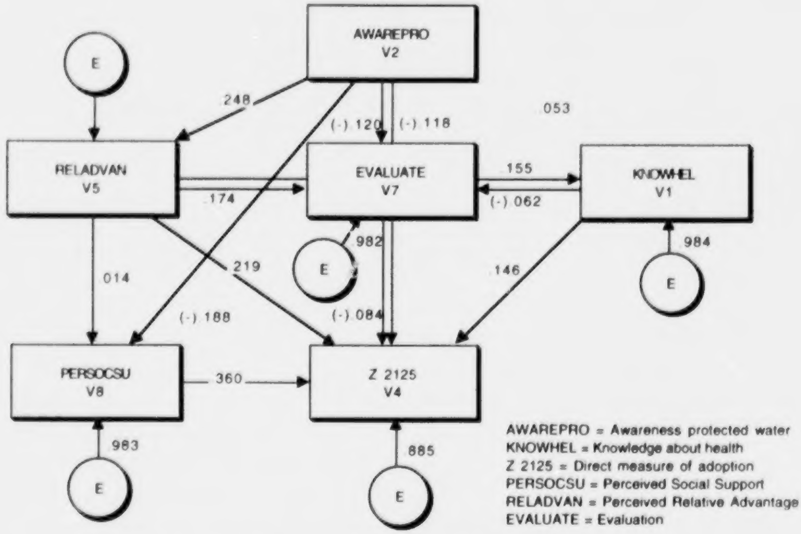
A non-recursive version of the model of factors influencing the adoption process along with the outcome variable of adoption was created. This was then input into the EQS least square structural equation software program.

Data representing indicators of each conceptual variable had to be specially prepared. Any missing responses were assigned to the mean value so that there was always a total of 100 responses per indicator. These responses, in turn, were standardized since some scales used had five possible responses, same had four and several had as many as eight or more. Next all the indicators of, for example, perceived relative advantage were added up to form a composite variable and restandardized. Restandardization was necessary since all of the indicators within a composite variable were highly correlated and when added together the standardization was altered.

A Pearson's correlation index of the composite conceptual indicator variables was run using the SPSS software package. The bottom half of the index formed the covariance matrix used by the computer program to measure the strength of the relationships between conceptual variables in a given village. So many units of change in one variable, e.g., perceived relative advantage, produced so many units of change in the succeeding variable. The degree of error was displayed for each variable and what was not error was explained variance. It is a form of path analysis.

Figure 3

Most Important Variables Only
Direct Measure of Adoption
Smaller Model


AWAREPRO
V2
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.248
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RELADVAN
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EVALUATE
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KNOWHEL
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.219
.146
.014
E
E
(-).188
(-).084
PERSOCSU
V8
.360
Z 2125
V4
.983
.885
E
E
AWAREPRO = Awareness protected water
KNOWHEL = Knowledge about health
Z 2125 = Direct measure of adoption
PERSOCSU = Perceived Social Support
RELADVAN = Perceived Relative Advantage
EVALUATE = Evaluation

EQS Least Square Structural Equation Model:
Village of Belshesha

Results

It is best to state from the outset that no attempt will be made to list comprehensively all the findings in a short paper such as this. Let us first examine the issue of adoption. It was measured both directly and indirectly in the villages of *Al Belsheshah* and *Al Edraygh* where protected water was present.

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Table 1.1
Direct Measure of Adoption

Where do you or your daughters get most of your drinking and cooking water from?

Nile, canal, irrigation ditch = Non-Adoption
Public or private tap = Adoption
Both = Partial Adoption

	Al Belsheshah	*Al Edrayqh*
Non-Adoption	23	27
Partial Adoption	10	18
Adoption	63	48
Non-Adoption	33	45
Adoption	63	48

Table 1.2
Indirect Measure of Adoption

Do you store water from the canal in the same or different container than the one you showed me?

Same container, different container = Non-Adopter
Never take such water = Adopter

	Al Belsheshah	*Al Edrayqh*
Non-Adoption	65	75
Adoption	24	18

In Table 1.1 the category of partial adoption was used, but regarding health, the partial adopter is virtually the same as a non-adopter. Table 1.2 is an indirect measure, and the question which followed asked, "What do they use the canal water for?" Responses to this question were varied and none mentioned drinking, but the presence of canal water in the house is suspicious at best. So in the village of *Al Belsheshah*, with the best protected water delivery system, somewhere between 33 percent to 65 percent of those responding are using canal water. This is a significant number. *Al Edraygh* is higher, but the access is more difficult and this may explain the increased number of non-adopters.

Selected Findings–Independent variables.

Table 2.1
Community Participation–Pre-innovation
Who has responsibility for getting public taps into a village?

	Al Hasafah
Government	32
Local council	20
Village leaders	32
Everyone	1
No one	0
Don't know	9

Table 2.2
Community Participation
Innovation Present

Were the public taps installed by the government without asking the people of the village, or did persons in the village participate in the decision to install the taps?

	Al Belsheshah	Al Edrayqh
Government only	55	58
Few villagers	11	10
Many villagers	16	4
Don't know	8	

The responses given in all three villages indicate little in the way of community participation in decision making regarding piped water.

Table 3.1
Awareness Of and Knowledge About Protected Water
Information Sources–Radio

Have you heard any information on the radio about using clean water?

	Al Belsheshah	Al Hasafah	Al Edrayqh
No	30	40	36
Yes	70	60	64

This indicates an exposure through the media to government information efforts. It is further corroborated by the fact that village women told the investigator that there were *mikrobs f'yl my-ah terrah,* microbes in the canal water. This and many other indicators point out that the villagers are informed as to the importance of clean water, but this does not increase its use.

Furthermore, no government change agent acted as an information source in any of these villages. There was no on-site government involvement to encourage adoption or report back to the rural reconstruction ministry.

Table 3.2
Can you tell me what you heard?

	Al Belsheshah	*Al Edraygh*	*Al Hasafah*
Good for health	40	49	44
Dangers of bad water	13	10	12
Use clean water for food	9	3	6
Government water project	6	4	2
It is God's gift	1	0	0
Nile water clean	0	1	0
Negative response	1	0	2

As is apparent above, most people responded that they heard clean water was good for their health or were told the dangers of drinking bad water.

Table 4.1
Perceived Relative Advantage

Other women in this village and other villages tell me that they do not always take their drinking water from the same place. Sometimes they prefer to use water from the canal for drinking and cooking. Why?

	Al Belsheshah	*Al Edraygh*	*Al Hasafah*
Convenience	16	11	5
Needs circumstances	14	20	5
God's will	6	7	3
Tradition preferences	0	4	4
No choice	50	49	62
Negative response	14	4	0

This projective question and the thematic content analyzed responses refer in context to the plight of the women water gatherers' lack of consistently available clean water. In *Al Hasafah,* there is no choice, but in the other two villages there is a suggestion that the availability, reliability, or dependability of filtered water is questionable.

Table 4.2
Where do you get your water when the public tap is broken?

	Al Belsheshah	*Al Edraygh*
Clean source outside village	36	31
Unclean water source	26	24
Other clean water source	7	4
Negative response	1	0

Most of the women who responded said they use another clean alternative source for water when the tap is broken, but see how many freely express their reliance upon the canal. Plus here is recognition that the public tap is a discontinuous water source.

Table 5.1
Perceived Social Support

Would you agree most people in this village take drinking water from the canal at least once a month?

	Al Belsheshah	*Al Edraygh*
Strongly agree	8	13
Agree	33	39
Uncertain	11	9
Disagree	35	18
Strongly disagree	13	21

This table shows that there is more perceived social support in *Al Belsheshah* for filtered water use represented by those who disagree or strongly disagree, but even then the percentage is close to half and half. This would indicate that in both villages there is little in the way of demonstrable social support for the use of protected water.

Table 5.2
Opinion Leadership

From which place did you tell the women to take their water?

	Al Belsheshah	*Al Edraygh*	*Al Hasafah*
Clean water source	30	40	27
Canal	6	1	24
Best available	4	1	2
Clean dirty source	2	1	1
Negative response	4	3	0

Opinion leaders in the innovation-present villages are overwhelmingly supportive of clean water use as represented above. Note the significantly different response in the pre-innovation village of *Al Hasafah*. Even though clean water is unavailable to villagers, 27 recommend its use while 24 still recommend canal use. Canal water use retains same significant support.

Table 6.1
Knowledge About and Attribution of Health to Protected Water

A test was administered asking the respondent to say whether the disease was caused by polluted water or not. A perfect score was 9 points. Here are the village distributions.

Al Edraygh–H_2OTEST–Knowledge of water as source of disease.

Value	Frequency	Cum Percent
.00	3	3.0
1.00	5	8.0
2.00	5	13.0
3.00	8	21.0
4.00	11	32.0
5.00	0	72.0
6.00	9	81.0
7.00	11	92.0
8.00	5	97.0
9.00	3	100.0

Mean score = 4.810

Al Belsheshah –$H_2$0 TEST–Knowledge of water as cause of disease.

Value	Frequency	Cum Percent
.00	4	4.0
1.00	4	8.0
2.00	5	13.0
3.00	8	21.0
4.00	10	31.0
5.00	37	68.0
6.00	13	81.0
7.00	7	88.0
8.00	10	98.0
9.00	2	100.0

Mean score = 4.880

Al Hasafah–H_2OTEST–Knowledge of water as a cause of disease.

Value	Frequency	Cum Percent
.00	2	2.0
1.00	2	4.0
2.00	4	8.0
3.00	13	21.0
4.00	9	30.0
5.00	37	67.0
6.00	11	78.0
7.00	9	87.0
8.00	11	98.0
9.00	2	100.0

Mean score = 5.050

In all three villages, results show villagers had little or no knowledge that certain diseases are caused by drinking canal water. They could have guessed and gotten the scores they achieved. This is a salient observation since lacking the knowledge of a causal link between water and disease robs the protected water of much needed motivation or relative advantage. It also fosters indirectly the propagation of unfounded fatalistic folk beliefs as to the cause of diarrhea and other diseases.

Table 7.1
Perceived Concern About Risk

What do you think the risks are from having a public tap in your village?

	Al Hasafah
Social disruption	21
Unreliable quantity and quality	27
Negative response	37

Villagers in a pre-innovation status express a significant measure of concern regarding the installation of a public standpipe. This type of anxiety would mitigate against adoption.

Table 8.1
Social Preconditions
Social Barrier

How does the *zir* (large earthen storage vessel) change water?

	Al Belsheshah	*Al Edraygh*	*Al Hasafah*
Length of time stored	9	11	9
Protection from impurities	27	22	6
Quality of water improved	59	53	79
Negative response	5	2	1

There is a strong folk wisdom that placing water from any source, sometimes from both canal and tap, into the *zir* will render it purified and clean. This is probably explained by the fact that solids in the polluted water are precipitated over time to the bottom of the container improving the water's general appearance but in truth not altering many elements such as possible petrochemicals. Bacteria, as earlier stated, find the container an ideal environment in which to multiply. This practice certainly does not increase impetus for clean water source adoption.

Table 9.1
Socioeconomic Status

What is your education?

	Al Belsheshah	*Al Edraygh*	*Al Hasafah*
Illiterate	89	77	80
Read and write only	2	4	3
Primary	1	6	9
Prep school	2	3	3
Secondary	2	6	2
University	0	1	0

If education is a predictor of adoption, certainly the high illiteracy rate is significant. This may be one of the most telling factors depressing possible adoption.

Structural Equation Model

The structural equation models developed of each village tended to have low explained variance. The highest explained variance was captured in the model of the village of *Al Selsheshah*. It was 26 percent.

It is clear to the investigator there could be many reasons why the rate of explained variance would be lower than hoped for such as the following:

1. This project was a synchronic study. It measured only one point in time, thereby diminishing the amount of overall variance in the distribution.
2. The project was undertaken in a village where there is a homogeneous population. Village life is structured by strong pressures to conform to the norms. Response distributions, therefore, were flattened still further by a lack of expressed variance.
3. Villagers were presented with a foreign situation when asked to respond to the enumerator with a given ranked response. This often turned the interviewer into a response rater, removing the data one step further from the interviewee.
4. The technique itself, that is, the EQS computer program, may require a stronger form of data, such as ratio level data rather than the Likert-type scaled data employed.
5. The fact that it worked best in the village offering the greatest opportunity to access clean water may indicate the technique is most amenable to an *ex post facto* analysis of a clearly delineated case.

Preliminary Summary of Findings:

1. No change agent was employed by the government to act as a source of information. Were such an individual present, they would have acted to bring information to the villagers from the government and vice versa.

2. Although most villagers had been exposed to government media campaign to stress the need for using clean water, they still resort to canal water. This points out the limitations of radio and television regarding public health. It can bring about awareness, but not behavioral change.

3. There was little, if any, relative advantage to villagers in using the taps provided since they were few in number and unreliable as to the quantity of water and water pressure.

4. Villagers lack understanding of the connection between the drinking of the canal water and the diseases it causes. They can repeat that there are microbes in the water, but it is a repetition almost devoid of meaning.

5. Villagers know they should boil water obtained from the canals. When asked if they do this, the reply is it takes too long or it makes the water taste bad.

6. There is little, if any, community participation in the village decision-making process regarding the piped-in water. When the system goes into disrepair, no villager has knowledge of how to repair it.

7. The village women water gatherers are illiterate, making their health education more difficult.

8. Social preconditions often present social barriers which act to vitiate any motivation to adopt.

9. Social support is lacking for filtered water use. Canal water usage is viewed as an acceptable, even expected, practice.

10. Significant numbers of villagers continue to rely upon canal water as a source for drinking water even when a source for protected water is present.

11 Billion in 2025! Will Malthus Prove to Be Correct?

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Europe in the late eighteenth century experienced a surge in population growth that was due to several factors. There was a decline in deaths due to disease; there was an increased use of vaccination, particularly in childhood; there were improvements in food supply and diet; there was a decline in the infant mortality rate; and women were marrying younger and having more children. The sharp increase in population pressed on available land, food supply, and other societal resources.

In 1798 Thomas Robert Malthus wrote his famous *Essay on Population* describing this phenomenon and predicting severely negative long-term results. He noted that the populations of Britain, France, and America were doubling every twenty-five years. But he stated there was no certainty that food supplies could increase at the same rate. He forecasted an ever greater gap between the people's food demands and the land's capacity to meet them. The inevitable result would be increasing starvation and deprivation, mass deaths through famine and disease, and a rending of the social fabric.

Other writers challenged this bleak forecast. The more optimistic writings of Godwin and Condorcet, for example, argued that the growth of human understanding, man's capacity for improvement, and breakthroughs in knowledge would lead to a society free of crime, disease, war, and the other social ills of their time.

Malthus' predictions were off the mark; but so were those of the optimists. Three developments permitted the British to avoid the Malthus prediction. The first was emigration. Between 1815-1914 around 20 million people left Great Britain. Fortunately, no government policy, foreign or domestic, prevented them from leaving. Second, there were so many significant improvements in farming output that an Agricultural Revolution could be said to have occurred. The improvements included rotation of crops, new breeding techniques, new implements, the introduction of the potato, the enclosure of common lands and draining of wetlands, better publicity and dissemination of farm methods, enhanced communication and access to markets, and the importation of food from America, Australia, and elsewhere. Third, and most important, Great Britain entered the Industrial Revolution. The Industrial Revolution boosted productivity to such a degree that both national wealth and general purchasing power outran the rise in the numbers of people.

During the nineteenth century, Great Britain's population grew fourfold; her national product grew fourteen fold. Britain was able to purchase the foodstuffs, raw materials, and other goods its population needed. Thus, "the power of population" was answered, not so much by the "power of the earth" itself, but by the power of technology–the capacity of the human mind to find new ways of doing things, to invent new devices, to organize production in improved forms, and to quicken the pace of moving goods. Moreover, the rising standards of living led to social changes–more years at school, improvements in the status of women, enhanced consumption, growing urbanization–all of which tended to decrease the average number of children born per family.

However, the British example or "escape" from the Malthus prediction was not common. Although Belgium, the United States, and Germany imitated Britain, many other nations were not so fortunate. Ireland in the 1840s, for example, experienced a decade of horror characterized by starvation and emigration that reduced population by one-fifth. India experienced food supply/population explosion problems almost as severe.

Another solution in Malthus' time to excess population was internal unrest and external aggression. The French Revolution and the subsequent drive for territorial conquest can be viewed, in part, as a vent for overpopulation, social tension, and political frustration. So could Europe's mad scramble for empire in the late nineteenth century that, in part, brought about World War I.

The Earth today confronts a population explosion, but not in the developed societies of Europe and North America as happened in the late eighteenth and most of the nineteenth century, but in the poverty-stricken regions of Africa, Central America, the Middle East, India, and China involving BILLIONS of people rather than millions in the eighteenth century. Some numbers reveal the dimension of the problem. In 1825, there were about one billion people on earth; in the following hundred years the world's population doubled to 2 billion; from 1925 to 1976 it doubled again to 4 billion. By 1990 the earth's population advanced to 5.3 Billion. There is a wide range in forecasts for the next thirty years. The middle range forecast calls for 8.5 billion by 2025, an increase of one-half over the present population. The World Bank predicts stabilization will occur at between 10 and 11 billion in the second half of the 21st century. Others have put the number at 14.5 billion.

In the period from 1985 to 1990, the world's population increased each year by 88 million, equal to the population of present-day Mexico. By some estimates, the rate of increase may climb to 112 million per year during the period 1995 to 2000 , an increase which is roughly equal to the population of Nigeria. This population increase is occurring primarily in developing nations. Between now and 2025, 95% of all global population increase will take place in them. In 1950 Africa's population was one-half of Europe's; but by 1985 it had drawn even at 480 million; and by 2025 it is expected to be three times Europe's (1.58 billion to 512 million).

Why are populations growing so fast? The developing nations are in a situation similar to England in Malthus' time. They are basically agrarian societies in their first generation of enjoying a significant decrease of mortality rates.

To explain European fertility decline after the Industrial Revolution, social scientists developed the notion of demographic transition. Death rates fell in Europe in the 1800s as living conditions improved and medical science advanced. Population grew rapidly, spurring migration overseas. Eventually in the 1900s birth rates fell, slowing population growth. This theory contends that *societies are initially* characterized by high fertility and high mortality, and as a result, population does not grow. In agrarian societies, it is normal for 200-400 of 1000 births to die within one year; many more die by age seven. The reason for couples in pre-industrial, agrarian societies to marry young and have many children is the twin assumption that each child would enhance the family labor force but that many would perish in their early years. This phase is followed by the *intermediate stage* in which modernization begins and mortality is reduced but fertility remains high. This period is one of rapid population growth. Only later does fertility decline. The *last era* is one of stable population growth, low mortality and low fertility, an accurate description of most of the developed world today and for the foreseeable future.

Developing nations are now entering this intermediate stage. In Tunisia, for example, the infant death rate (first year, per 1000 live births) dropped from 138 to 59 between 1965-70 and the years 1985-90, and the child death rate (deaths of children under 5, per 1000 births) dropped from 210 to 99. As a result, Tunisia's overall population doubled from 1960-1990. From health advances, according to some predictions, Nigeria could expand from 113 to 301 million by 2025, Kenya from 25 to 77 million, Tanzania from 27 to 84 million, Zaire from 36 to 99 million, without corresponding increases in resources. Indeed, resources may be shrinking. Within the next thirty years, China's population may grow from 1.13 billion to 1.5 billion; India may grow from 853 million to surpass China and reach 2 billion. By that time Pakistan will have 267 million people, Indonesia may have 263 million, Brazil will have 245 million, Mexico will have 150 million, and Iran will grow to 122 million.

In conjunction with and as a result of such startling predictions, a new body of writings has been produced during the past twenty-five years that can be labeled Malthusian in tone and content. Most of these neo-Malthusians are biologists and environmentalists. In 1968 Stanford University biologist Paul Ehrlich published the

Population Bomb. At a time when the world's population was 3.5 billion, he predicted famines in which hundreds of millions would starve. Fortunately, this did not happen. Instead, food production soared worldwide and prices dropped. In 1990, Ehrlich, with his wife, published *Population Explosion.* The message was the same, only the timetable was revised. Supporting their argument with pages of statistics, charts, and tables, they warned that the environment and human communities were overloaded. Global warming, acid rain, the hole in the ozone layer, rampant crime, viral epidemics, homelessness–all stem from overpopulation.

According to the Ehrlichs, the key limit on the carrying capacity (the maximum number of individuals a habitat/environment can support) of the planet is photosynthesis, the ability of plants, algae, and bacteria to covert energy of sunlight into living tissue. They estimate that humans and their domestic animals consume 4% of the solar energy that photosynthesis captures on land. Adding the amount we do not directly consume but destroy and the amount we prevent from growing raises the human share to 40%. This is a disproportionate amount for one species. He says Malthus was not wrong! The use of coal and oil, which fueled the industrial revolution, was a one-time bonanza.

The predictions and concerns of the neo-Malthusians are of five types. The first is the concern for the effects of population explosion on living conditions. Can poor agrarian societies deal with population growth? The Malthusian answer is famine, an inevitable struggle to gain foodstuffs and resources, open conflict, war, and disease that would eventually reduce the size of the earth's population. Europe, as stated above, escaped this scenario because of Industrial Revolution. Some "Third World" nations have done so too; among them are the newly industrialized nations of East Asia: Singapore, Taiwan, South Korea, and perhaps Malaysia. As these East Asian standards of living have increased, total fertility rates have declined: South Korea from 4.5 in 1965-70 to 2.0 in 1985-90 and Singapore from 3.5 to 1.7. These trading nations may be unusual or unique–they are small, possess favorable geographical locations, a skilled population, and an openness to foreign techniques and fashions. But this is not true of Zaire, Iran, Mali, Ethiopia, and others where a combination of structural and cultural barriers block development. Almost daily we observe scenes of mass poverty on television–starvation in Ethiopia, Somalia, and the slum cities of central America.

Urban poverty growth is of particular concern. In 1985 about 32% of the population in the developing world was urban. This figure is expected to rise to 40% by 2000 and to 57% in 2025. Today 1.4 billion are in urban areas of developing countries; there will be a crushing 4.1 billion in 2025. Most surprising is the prediction that

Latin America will be the most urbanized area in the world, with 85% of its people in cities; in Africa about 58% will be urban; in Asia about 53%. By the end of this century there will be 21 megacities of 10 million or more, 18 of which will be in developing countries. Leading the list for the year 2000 will be Mexico City with an estimated 24.4 million, followed by Sao Paulo with 23.6 million, and Calcutta with 16 million. Some African cities are growing by 10% per year!

This trend involves not simply a question of numbers, but also a potential change in our social and cultural assumptions about urban living. For centuries cities have been centers of wealth and culture. The Asian, Latin American, and African cities have become centers of poverty and social collapse. Order and safety have disintegrated in some. The concentrations of people are breathtaking and almost impossible to fathom–143,000 per square mile in Lagos, Nigeria; 130,000 in Djakarta, Indonesia; but only 11,400 in New York City (the standard of overcrowding for most Americans).

The increased concentrations and urbanization will be, if they are not already, tremendous burdens on cities' already inadequate housing, sanitation, transportation, food distribution, and communications systems as their populations double and triple. Over time urbanization leads to a decline in the rate of population increase. The real challenge comes in the next 20 to 40 years when urbanization in developing countries will exacerbate all problems associated with high population density.

The second type of concern of the neo-Malthusians is the effect of population explosion on the environment. Environmentalists see the earth as under a two-fold attack–excessive demands and wasteful habits of affluent nations, and billions of new mouths born in the developing world who aspire to increase consumption levels. They see the future as a race against time. If we do nothing to stabilize the population of the world, curb use of energy, foodstuffs, and raw materials, and to control damage to the environment, we will pay a heavy price. Already, population pressures in many developing nations are causing the depletion of agricultural resources (i.e., overgrazing in African savannas, erosions of Amazon rain forests, salinization of land from India to Kaz). Interestingly, although nearly all of this population growth will be in developing nations, it is not just their problem. It affects the developed nations too because rain forest depletion and water supply damage contribute to global warming.

The third type of concern of the neo-Malthusians is the effect of population explosion on international security. A consequence of increased population could be the prospect of demographically driven social unrest, political instability, and regional wars. Central America, South Africa, SE Asia, Afghanistan, the Middle East, Ireland, the rim lands of the USSR–all have fast growing, youthful populations with pent-up social and economic expectations. The

Gaza Strip with a population density of 4206 per square mile versus 530 in Israel is a place of unrest due, in part, to demographic problems. The popularity of the Intifada is strongest among the youth and young adults who see diminishing prospects.

In 1950, the industrial democracies accounted for 1/5 of the world's population; by 1985 it was 1/6; in 2025 it will be only 1/10. Only two of them, the U.S. and Japan, will be among the top 20 most populous countries. If the developing nations do manage to raise their output and standards of living, the West's proportion of economic output, global power, and political influence will decline simply because of the force of numbers.

The fourth type of concern of the neo-Malthusians is the effect of population explosion on mobility. A logical response when population explosions occurs in nations with relatively meager resources is for people to move to where opportunities beckon. People tend to migrate first from countryside to cities, a trend which is already happening in the developing world. This is often followed and accompanied by a decision to migrate from country to country. This raises the problem of how to care for immigrants if resources are believed to be limited. Also, large scale immigration raises fear of losing control of national boundaries and traditional sovereignty; it creates fears of a "pure" race being altered through intermarriage; it creates fears of strange ways of life, religious norms, cultural habits; fears of newcomers encroaching on property, educational systems, and social benefits paid in taxes by natives. Examples of these migrations and their resulting fears and conflicts are easy to find: in the U.S., the Mexican, Asian and Haitian migrations have provoked conflict; in Germany, the Turkish migration has done the same; in Japan, resentment and hostility have been directed at Southeast Asians; in Europe, natives have reacted against migrant Tunisians, Moroccans, and Algerians whose populations are doubling; in Britain, similar reactions have occurred against Indians and Pakistanis.

Developed nations will probably make efforts to guard their boundaries from large migrations; but desperate migrants will not be deterred. The problem of illegal Mexican migration into California and the Southwest will not go away. The push-pull factors are very strong. Developed nations, with their high standards of living and availability of relatively high paying jobs, will continue to attract immigrants from developing nations. If the developing world stays in a state of poverty, the developed counties will be pressured by millions of migrants and refugees.

The fifth type of concern of the neo-Malthusians is the effect of population explosion on disease. The world-wide AIDS epidemic may significantly affect population projections. The disease is especially prevalent in Africa. The World Health Organization predicts that 40 million people will be HIV positive by the year 2000, fully 90% in developing countries. A 1992 report from Harvard raised the predicted total to 100 million, with more cases in Asia than Africa.

During earlier periods of urban collapse, the fact that human society was largely rural tempered the effects of catastrophes. When the Black Death wiped out 80% of Europe's population, more than 95% lived in the countryside. But if the new world enters a new age of epidemics, few will escape unaffected. In the megacities of the near future, the toll may be horrific. Some medical scientists suggest they could bring the triumphant return of microbes that toppled empires throughout history. Harvard public health expert Jonathan Mann states, "We only have a truce with infectious disease, and if a city's infrastructure gets overloaded, the balance can tip back to the microbes." The cholera epidemic that hit Latin American cities in 1992, hospitalizing 400,000 and killing 4000, is a case in point.

Large cities are breeding grounds for novel, antibiotic-resistant strains of old germs and for entirely new kinds of microbes. AIDS may be one. Tuberculosis, an old disease, attacks weakened AIDS victims and uses them as beachheads for invading healthy populations. Some fear that AIDS evolved in African rain forests ; and as humans continue to cut back tropical forests, other opportunistic new viruses may emerge. What if one is fast spreading and highly contagious, unlike AIDS?

Inadequate sanitation provides new pathways for disease. In Mexico cysticercosis, caused by a tapeworm that invades the brain, used to be transmitted primarily by improperly cooked pork. Now people are getting the disease from vegetables grown in fields irrigated by water containing effluent that flows into the Tula River from Mexico City. Uwe Brinkman, a Harvard epidemiologist, estimates that 300 million urban poor in the developing world are in a permanently weakened condition because they carry parasites.

As Malthus was met with critics two hundred years ago, the neo-Malthusians have been challenged by competing predictions that are much more optimistic. These counterclaims take several forms. Dennis Ahlburg, University of Minnesota Center for Population Analysis and Policy argues that the evidence is not there to confirm that population is a horrible thing. He contends that it is not population that causes the problems of poverty, famine, urban crowding, deforestation, and pollution. The resources exist to support people; the problem is that societies encourage waste. Population is an easy scapegoat for political failures.

The National Academy of Sciences, which supported Ehrlich's position in 1971, has changed its position. In 1986 its new report found the effects of population growth to be exaggerated. The Academy recommended slower growth for developing nations to give themselves time to adjust to the larger populations, but not because they are breeding themselves into oblivion. The Academy noted that despite rapidly increasing populations, many developing nations have achieved much higher per capita incomes, literacy, and life expectancy. Ehrlich argued that the new report was written entirely by social scientists who knew nothing about the subject. Ehrlich belongs to Club of the Earth, which issued its own report in 1988 that said the opposite of the Academy. All the writers of the Club report were biologists rather than social scientists.

Julian Simon, a professor of business administration at University of Maryland, argues that population growth, along with lengthening life is a moral and material triumph. He contends that gradual population growth not only does not harm us and the environment but actually accelerates our progress. Simon says Ehrlich and his group are wrong on nearly everything: food, energy, resources, environment. He believes the most relevant measure of human well-being is life-span, which has increased dramatically, even in developing nations. Food production per capita has increased since WW II, and he says the same holds true for every other resource people worry about.

In 1981 Simon published *The Ultimate Resource.* In it he argued that the concept of carrying capacity should not be applied to humans. Malthus and his followers pay too little attention to an important fact: humans are resource producers as well as consumers. As a resource becomes more difficult to obtain, people find ways to get more or use it more efficiently. Or they try to develop substitutes. Our resources expand rather than shrink; people will constantly escape the Malthusian trap. In fact, population growth applies a needed spur. In the short run, new people are a burden; but in the long run they are the solution. As adults they add more to our stock of resources than they consume.

Simon has tremendous faith in technology. He points to dire predictions about India in 1968 when it had 500 million; India now has 835 million and feeds itself. Ehrlich has countered by arguing that India has merely postponed its problem; it created environmental havoc in order to feed itself.

Curtis Skinner, another critic of the neo-Malthusians, asks whether the environmental and living conditions problems listed by the neo-Malthusians are the result of population growth or the failure of existing socioeconomic systems to create sources of livelihood for growing populations. Skinner rejects the carrying capacity concept, which he contends is static. Land tenureship patterns and available technologies, along with pricing and marketing policies, exert determining influence over the size of population that a given agricultural region can support. In Brazil, for example, ample land lies vacant while people starve. The problem is land distribution, not overpopulation. He argues that a shift from monocropping for export to traditional systems of intercropping, crop rotation, and mixing plant and animal production would increase soil fertility and support larger peasant populations without degrading the environment. The reforms to bring this about are in the political realm.

Skinner believes that the earth produces more than twice as much food as needed to provide all with a basic diet. The ability to create sufficient energy is also available. The problem is a faulty and inequitable political economic system in most developing nations. The most important thing we can do is to support Third World political and social movements that empower the mass of the dispossessed and take measures to improve their living conditions; the solution is not biology, but politics.

Although not critics of the neo-Malthusians, Bryant Robey, Shea Rutstein and Leo Morris, in their recent article "The Fertility Decline in Developing Countries" (*Scientific American*, December 1993), give evidence in the area of fertility and birth control that considerable change and progress may be underway that will lessen the extent of the population explosion. The writers have found a recent decline in fertility in the developing world that does not fit the social science theoretical framework well with respect to timing and circumstance. Their findings refute the notion that "development is the best contraceptive" (the slogan of the 1974 World Population Conference). They cite the example of Bangladesh, which is one of the poorest nations in the world, one of the most agrarian and underdeveloped, where infant mortality is high, women have low social status, and most families depend on children for economic security–yet fertility rates declined 21% from 1970 to 1991. During this period, the use of contraception rose from 3 to 40%. They argue that the developing world is undergoing a reproductive revolution; women differing vastly in culture, politics, and social and economic status have started to desire smaller families. Birth rates have declined by 1/3 since the mid-1960s; women who formerly had six are now having four children. The fall in fertility rates has been dramatic in nearly every country they examined: Thailand–50% in 12 years (4.6 to 2.3); Columbia–4.7 to 2.8; Indonesia–46% from 1971 to 1991; in Morocco 31% between 1980 and 1992; Turkey–21% between 1978 and 1988; in eight Latin American countries women are having one fewer child than did women 20 years ago.

During much of the period of fertility decline in the West, contraception was not available, it had not been invented, and family planning was not accepted (e.g., Margaret Saner). In Great Britain and the U.S., declining birth rates came only after economic growth had brought improvements in health care and education. This transition took many decades. The availability of effective contraception gives developing countries a major advantage. Developing nations are much earlier than expected experiencing the demographic transition that took place in many industrialized countries over the past century. Birth rates have fallen in recent years in developing countries in the absence of improved living conditions. The reasons are that developing countries have benefited from (1) growing influence and scope of family planning programs, (2) new contraceptive technologies, and (3) the educational power of the mass media. This finding has extraordinary implications for future efforts to slow population growth.

Family planning is a most powerful influence. Excluding China, 38% of married women in childbearing years in the developing nations they studied use contraceptives; for every 15% of contraceptive use, the fertility rate goes down one child. If China is included, the rate rises to 51% of childbearing age women who use contraceptives. In the industrialized nations the rate of use is 70%. Education and urban life are associated with contraceptive use, but these findings suggest that they are not a prerequisite! Columbia and Indonesia are cited as examples where it is definitely not related to education and urban life.

Sub-Saharan African has shared in the decline despite notions of cultural impediments. Examples are Botswana–26%, Kenya–35%, and Zimbabwe–18%. Urbanization and support of government for slower growth had a role there. Mass media campaigns in several developing nations have changed attitudes about family planning (Ghana, Kenya, Nigeria, Gambia, Zimbabwe are cited); clinics are provided by the government that disseminate both information and family planning services.

Their conclusion is that Contraceptives are the best contraceptives (i.e., not development)! Yet they are cautious about their message. The decline in fertility has not occurred in all developing nations; and it is still higher than in developed nations. Fertility far exceeds replacement level in these countries. For fertility to fall further, contraceptive use must increase to a larger percentage of the population. Factors that will keep fertility decreasing are the following three: (1) how fast societies develop, (2) how quickly new norms concerning small families and the use of family planning are accepted; and (3) how well public programs and private suppliers can meet the need for contraception. Demand for family planning already exceeds supply. They estimate that if the supply did meet the expressed need, the fertility rate would fall in developing nations from four children to three! This would reduce the rate of population growth in the developing world (excluding China) from 2.3% per year to 1.6% per year. The population of the developing world would be 5.1 billion in 2025 instead of 6.5 billion. It would cost $2.4 billion per year for family planning programs to reach the 120 million women whose demand for contraception remains unsatisfied.

In late January 1994, the Clinton administration announced it is seeking increased spending for population control programs to attain the goal of providing every woman in the developing world with contraception who wants it. This is a sharp departure from the Bush administration. Clinton proposed spending $585 million in his FY 1995 budget, double the amount spent in 1992. He proposed raising annual spending to $1.2 billion by 2000. He stated the U.S. will cooperate with World Bank and other countries in an effort to stabilize world population at 10 Billion and head off environmental catastrophe. Clinton has received the support of the Chairman of the Senate Appropriations Subcommittee on Foreign Operations, Patrick Leahy. It is worth noting that Reagan and Bush opposed spending on this effort because they opposed the notion of the U.S. government spending for abortions and contraceptives.

Who is Right? The neo-Mathusians or their critics? The demographic changes of the eighteenth century are back, but this time, on a global scale. Those same interrelated issues–overpopulation, pressure upon the land, migration, and social instability on the one hand, and technological power to increase productivity and to displace traditional occupations on the other–still confront us today. The population explosion is occurring in the developing nations with limited technological resources, few skilled workers, inadequate investment in research, cultural and, in some cases, ideological prejudices against change. The possibility of catastrophe is great.

But, at the same time, we are witnessing a knowledge explosion in technology and production in the developing nations. The great test is how to use the power of technology to meet the demands thrown up by the power of population–how to find effective solutions in order to free the poorer three-fourths of mankind from the Malthusian trap of malnutrition, starvation, resource depletion, unrest, enforced migration, and armed conflict–developments that endanger the developed nations. Maybe we will be lucky one more time.

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The Built-In Momentum for World Population Growth

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The purpose of this presentation is to demonstrate how the built-in momentum for world population growth will result in large future increases in human numbers even with substantially reduced birth rates. World population in 1994 stands at about 5.5 billion people and is growing at the rate of 1.6 percent per year. If this rate continues, the world's population will double every 42 years; it will be 11 billion in the year 2036, 22 billion in 2078, 44 billion in 2120 and so on.

To illustrate how world population will grow given different fertility assumptions, we will look at several 100-year projections generated by the program "DemoGraphics." This program starts at the year 1980 when world population was about 4.4 billion and the total fertility rate (TFR) was 3.7 lifetime births per woman. If this birth rate were to remain constant, world population would increase fivefold to about 22.1 billion by the year 2080. Obviously, such an increase would be disastrous.

In order to reach zero population growth (ZPG) eventually, the world's birth rate will have to decline eventually to an average of 2.1 births per woman. This birth rate is referred to as "replacement level fertility" because the number of children equals the number of parents; the extra 0.1 birth is for individuals who die before they become parents. The DemoGraphics projection indicates that if the world TFR was 2.1 in 1980, population would continue to grow during most of the next 100 years and not level off until it reached 11.5 billion during the very end of this time period.

The seeming contradiction between a society at replacement level fertility and continued population growth leads us to the main point behind this presentation. The built-in momentum for population growth refers to the fact that a large proportion of the individuals in developing countries consists of children who, though not yet, will become tomorrow's parents; this phenomena is also referred to as a population having a "young age structure." Because these young cohorts are considerably more numerous than today's parents, population will continue to grow even at reduced birth rates.

To illustrate the magnitude of this built-in momentum, we next examine a DemoGraphics's projection at a vastly lower TFR of only 1.1 births per woman; that is, an average of slightly over one child per family. At this birth rate, world population would still continue to grow for approximately sixty years, reaching a maximum total size of about nine billion, before starting to decline!

These projections, while not predictions of what will happen a 100 years from now, illustrate the urgency of reducing the world's birth rate. Making contraceptives available to all of the world's couples, as well as changing underlying social conditions in order to motivate parents to want fewer children, should be at the very top of our national agenda. Only vigorous programs enacted now hold the promise of reducing the sum total of human misery in the future.

Eudaimonia

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I. Introduction

Eudaimonia is a Greek word that is usually translated as *happiness*, in the sense of *well-being*. Aristotle [384-322 B.C.E.] considered it the highest good and thought it obvious that it was the goal at which all of us aim, all other goods being instrumental in relation to it. Aristotle recognized that without the fulfillment of our basic needs for food, shelter, health, etc., happiness is impossible but, on the other hand, that luxurious goods are neither necessary nor sufficient for happiness.[1]

Life's necessities are ultimately supplied by nature. Our chances for happiness are rapidly diminishing, for our natural environment is becoming more and more damaged and is in danger of irreparable disequilibrium. So our interest lies in finding what we can do to reverse the damage and possibly to heal or nurture nature. If with Aristotle we acknowledge that our very well-being depends on goods that only nature can supply, then it follows that our interest in nurturing nature should be accorded a very high priority status, if not the highest.

To the moral[2] question of who is responsible for nurturing nature, the easy answer is that the responsibility is ours collectively. But for this judgment to be reasonable and have practical import, to say that we are all responsible must mean that each of us has individual responsibilities. The difficult task is to reach some broad consensus on what each of us must do and to generate the will to do it.

Assuming that we are able to make decisions based on free choices and are for the most part capable of acting upon our decisions, each of us can be held accountable for our actions and, to a certain measure, for our thoughts.[3] Moral rules guide actions, and overall principles justify the rules. Thoughts are not subject to regulation, but they may be influenced by expressions of approval or disapproval or some type of propaganda. What stops us from single-mindedly applying our insights is just that we are by no means of one mind about what to do, how to do it, or for whose benefit.[4]

II. Clarifying the Question

To answer the nurturing of nature question, we must be clear about:

A.) what is included in "nature;" B.) our ability to benefit or harm nature; and C.) the "ought" of moral responsibility.

A. Three main positions have historically been taken on the question of what is covered by the term "nature." Justifying the extent of our responsibility toward nature is intimately connected with our ontological view about what nature is.

1. Nature = the universe, including ourselves. This expresses a mystical ontology, based upon both western and eastern meditative practices. Monistic philosophies usually locate the power in nature (immanent). Dualistic philosophies usually locate the power in a transcendent being.

2. Nature = the universe, but not ourselves. This view is alternatively expressed as (a) both we and the universe were created by a transcendent deity, who gave men dominion over the earth and its nonhuman creatures (religion) or (b) both we and nature evolved, but we are the only conscious, decision-making beings (science).[5]

3. Nature is the earth, the solar system (and ourselves).

We are essentially children of the earth,[6] and are naturally (e.g., seasonably) influenced by the cycles of the sun and the moon. All other living things are our kin, and many nonhuman beings are conscious or have souls. The stars and planets may also influence us in a "supernatural" way.

B. 1. Our attitudes and ways of life can both benefit and harm nature. This view is compatible with any one of the above ontologies, except possibly some theistic views that locate the power to benefit (created) nature in the divine, but may credit us with power to do harm. This view has implications for our moral responsibility to at least undo some of the harm already done through human agency.

2. Our attitudes and ways of life cannot benefit nature, but may do harm to nature. This view precludes "nurturing," but does allow for our moral obligation to avoid or minimize harm to nature; it may be either religion or science based.

3. Neither harm nor benefit to nature can come from our attitudes or our way of life. This view is implied by fatalism, and it implies no moral responsibilities.

C. 1. "Jones ought to do x" implies "Jones can do x."

This basic metaethical principle keeps us from assigning absurd moral obligations to anyone. Also, it only shows ability to be a necessary, but not a sufficient condition for obligation; "can" does not imply "ought!"

2. "Ought" expresses obligation or duty. Since obligation involves placing burdens on persons, judgments about duties or obliga-

tions are in need of rational justification (i.e., good reasons alone justify judgments about obligations). Some moral obligations may be directly related to moral rights.

3. Not all moral judgments directly express obligations. Some moral judgements describe actions that are morally permitted, either in the sense of nonobligation to refrain from an action or of describing supererogatory[7] actions.

It is plain that if we are serious about our moral responsibilities regarding nature, then, given the urgency and the size of the task, we must find rational ways to cooperate in the face of differences in our ontological views and commitments. Constructing an ontology is partly a matter of observation, based on what we experience, but it is also a matter of decision: how we relate, classify, and explain experience. Many plausible conceptual schemes are possible, all based on experience and social/epistemic needs. We need to distinguish implausible interpretations of experience motivated by deep emotional needs, but otherwise poorly grounded from those for which a rational account can be given. The latter are not infallible, but they serve better than the former in our attempts at noncoerced cooperation.

III. Normative Ethical Theories

Normative ethical theories are divided according to their way of justifying moral rules or maxims. Consequentialist theories justify the rightness of a moral rule or action by the goodness of the reasonably predictable, relevant consequences of the rule or action. Those moral rules or actions are preferred that in some specified way optimize the results. Such optimization is said to lie in a maximization of interests, such as pleasure (or absence of pain), liberty, self realization, salvation, enlightenment, and so forth. No rule or action is judged morally right in itself, but only because of its consequences.

Consequentialism may be a useful normative ethical theory for judging some aspects of actual or proposed social policy and legislation. Holding, as most of us do, that regulating social behavior through policy or laws is a necessary curtailment of individual self-expression for the sake of optimizing the just pursuit of our goods and values, judging the effectiveness of laws or policies is largely an empirical matter once we have some consensus on rank ordering our values. The latter is not easy, but much could be agreed upon if we decide to avail ourselves of the insights from the behavioral and social sciences.

Nonconsequentialist normative ethical theories (also known as deontological or formalist theories) do not judge the rightness of moral rules or actions by the goodness of their consequences, but rather by their conformity to a formal principle. Formalist theories are considered "rights based" by some who hold that duties or obligations are only derivable from prior established moral rights. Some basic rights are the right to life, to defend our life, and to minimal well-being. On this view we can know what our individual moral obligations are by noting whose rights need to be respected, and to what extent; where no rights have (as yet) been identified, no moral obligations exist.

A classic (but still used) formal principle is Immanuel Kant's [1724-1804] Categorical Imperative: "Act in such a way that you can rationally will the maxim of your action to become a universal law of nature." It was designed to inform us what our duty is in a given context. Its name expresses that it is not a hypothetical rule (thus not consequentialist) and that it is without exception. Kant thought that we have direct duties to all and only rational beings. Kant's related principle: "Never treat any rational being, yourself included, as a means only, but always as an end in itself" is known as the "principle of respect (for persons)."

A deontological theory can be quite helpful for individual persons to decide what their obligations are (and are not) under various imaginable circumstances or in a given particular case. The principle of respect helps us keep in mind the limits beyond which we should not go in the desired exercise of our individual liberty to pursue our ends. However, rights-based obligations seem to many of us too minimal.[8]

There are variants of consequentialist and formalist ethical theories, most of them modifications (attempted improvements) of the classic ones of Jeremy Bentham and John Stuart Mill (their utilitarianism is a form of consequentialism) or of Kant's deontological system. Some, as for example John Rawls' theory of justice, are a combination of deontological and consequentialist theory, aiming to combine the good features of both, while avoiding their bad features.

IV. The Ethics Of Virtue

The ethical theories described so far are fairly useful for rule-governed behavior. But this makes them only of limited value, for not all our moral decisions are made according to rules. Many stem from our attitudes and sensitivities, which are products of our cultural heritage as transmitted through teaching, training, and role modeling. They find their expression in specific virtues or excellences that reflect our life plans and the goods we value.

Lately there have been sharp criticisms of our individualistic ways, blaming the latter for our lack of commitment to improve human existence and the natural and artificial systems on which it depends and rests. The critics explain that "rule morality" is largely the cause of our lack of social commitment to foster *eudaimonia.*

Aristotle pointed us to the fact that, although all of us aim at our own good, we are not all equally clear nor of one mind about what our human good consists of. Aristotle thought that the "good for man" (our telos) lies in an "activity of soul in accordance with perfect virtue." Virtues are excellences of two kinds, intellectual or moral. Intellectual virtues can be taught; moral virtues are acquired by training the habits (of emotions as well as of actions).

Training the virtues is largely a matter of patiently encouraging "good ways" to take hold. The young, Aristotle pointed out, learn mostly by imitation, so originally they form virtuous dispositions by emulating virtuous people who raise them and are their role models. As they attain the age of reason, they will be able to determine what the virtuous way to act is in a given situation by engaging in practical reason. For example, a man of practical reason evaluates a set of circumstances for their (potential) danger, clarifies his present status, and decides what part of the danger to meet head on and what part to avoid. To avoid manageable danger would make him a coward, to court unnecessary danger would make him reckless. In between these two extremes of deficiency and excess lies the virtue of courage.

This example shows that, although a person raised to esteem a virtuous life may have observed several instances of other people's courageous acts, one does not simply tap into a repertoire of learned virtues and bring up the one most suitable for the occasion. To act virtuously means active involvement of reasoning and imagination.

Critics of (excessive) individualism point out that we could improve the world and ourselves by practicing a modern kind of "virtue ethics," in a life style they call "communitarian," in contrast to the present western civilizations' isolated, fragmentary modes of life. Contemporary young people who, because of this fragmentation, don't have much of a chance to formulate a plan for a satisfying and good life for themselves, and who act upon their lack of connectedness by forming tough communities for themselves (more or less dangerous gangs), would be immensely better off in a caring, mature community, with established virtuous ways.[9]

Virtue Ethics certainly does have potential advantages for socialization, for it fosters positively engaging in actions rather than remembering rules prohibiting actions. But communitarianism also has pitfalls. For communities to be effective in fostering virtuous habits, they need to be small enough for plenty of meaningful personal interaction, and so there must be many of them. Communities would come in many varieties, yet the differences among them should not be so great as to be obstacles to cooperation between them.

In our small communities we cannot afford to neglect to foster the "super virtue" of considering ourselves ultimately a member of a very large community, namely the sum of all the small ones.[10] Nothing less than all people on our planet are involved in this large community, a fact brought home by the global extent of our environmental problems.

Great wisdom is needed to foster appreciation and practice of the cultural ways of one's own small community, but at the same time to value the ways of others as equally to be appreciated and practiced by those others. Moreover, no community should foster the attitude that its already socialized members would be somehow considered disloyal, should they want to move into another community with different ways. Nor should there be deliberate, systematic withholding of information about other communities' ways from adults.

V. The Cooperative Way To Nurture Nature

Some think that communitarianism won't really work in our modern age, characterized as it is by excessive desires for material goods and unlimited freedom. Many of us who have a comfortable life, with our material needs and our need for human companionship met, consider that living by a minimal set of rules is all the morality we need to practice. To engage oneself in a real community would restrict our liberty[11] and tax our energies more than they are presently restricted or taxed, or at least in different, unaccustomed ways. Even the knowledge of being surrounded by vast pools of human misery amidst increasingly worsening environmental conditions for the most part is not enough to shake us from our commitment to "lifestyle as usual." So what does it take to shake us and help us realize that our demands for goods may be both excessive and unrealistic or that our isolated, largely indifferent individualistic ways of life are counterproductive?

Disasters at close range can make us less complacent. We become more interested in changing the conditions that cause large chemical explosions (Bhopal,1984), great oil spills (Exxon Valdez, 1989), nuclear explosions (Chernobyl, 1986), acid rain (we have it), the exploitative cutting of the rain forests, etc, only if we understand to be seriously affected by them. Provided we pay any attention at all, these dramatic disasters hit us over the head with the fact of our interdependence and the need for cooperation, and thus for community. We then begin to regard the universe, including ourselves, as a great system of a multitude of things, associated in many natural and other ways.

Human associations are an outgrowth of our given biological and psychological reality. They are characterized by a "natural" mutual interdependence, although not always by cooperation. Those who believe in the efficacy of a "natural economy" (guided by Adam Smith's "invisible hand") hold that commercial exchange alone would bring about such an appreciation of our interdependence that harmony would automatically result. But this view is too naively optimistic.

Community is only possible because of interdependence. But unfortunately, it does not directly flow from it, for interdependence, as Kant's predecessor Rousseau reminded us, also offers the conditions that make exploitation and subjugation of the weak by the strong possible. The wish to avoid loss of freedom and dignity is the very reason for our attempts to become personally independent through isolation and a cause of our failure to create community. However, as our disastrous environmental experiences make clear, it is an illusion to think that such independence is either beneficial or possible on a universal scale.

Democratic ways of cooperation are understood to be the most effective ways to avoid exploitation or subjugation and to find the best and most lasting means to preserve our chances for a good life on our planet. We must insist, with Dewey[12] and others, that democratic ways be perfected in all our communal efforts and settings since we are all (individually and jointly) responsible for nurturing nature, and everyone's well-considered input and cooperation is needed. The problem of creating the conditions that make this goal realizable is a moral one, dependent upon intelligence and education.[13]

The latter realization makes clear what our responsibilities are in the question of healing or nurturing nature. They amount to nothing less than being honest in our investigations of what is possible, what is morally desirable, and how long we have left to "study" these matters before acting upon them. Each one of us, however small we are in relation to the vast universe, should not delay acting on our best insights, not the least of these being ways to cooperate. After all, it is only when our beliefs are tested in action that they can be improved.

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Notes

[1] Aristotle, *Nicomachean Ethics*, any edition

[2] The question of who should nurture nature is a moral one, since in this context there is the possibility of serious harm or benefit to others.

[3] I use "thoughts" here (rather than the dubious "mental states") to include ideas, emotions, attitudes, intentions, etc.

[4] For example: Are just people to be considered and the rest of "nature" preserved for our use only? Should all people equally share the burdens/benefits of altering our ways of life, and what does this mean in practice, if so?

[5] Both (a) and (b) may imply "stewardship" responsibilities.

[6] This is meant as a "generic" summation of a great variety of myths expressing our essential kinship with all other natural things within our solar system.

[7] Supererogatory actions are those that are good to do, but not wrong not to do. There is a significant amount of disagreement about whether specific concerned behavior toward others, including our environment, is or is not merely supererogatory.

[8] See for example Julius Moravcsik, "On What We Aim At And How We Live," reprinted in William H. Shaw, ed. *Social and Personal Ethics*, Wadsworth, 1993 pp. 65-78.

[9] A friend of mine occasionally likes to quote his grandparents' wisdom: "It takes a village to raise a child."

[10] John Dewey referred to this larger community as the "Great Community" and struggled with the question of how the "Great Society" of our modern United States could become the Great Community. John Dewey, "The Public and its Problems," reprinted in *Communitarianism: A New Public Ethics*, ed. Markate Daly, Wadsworth 1994, pp. 154-165.

[11] It is beyond the scope of this essay to take up the issues of the debate between Liberalism and Communitarianism. Two helpful articles are Amy Gutman's "Communitarian Critics of Liberalism," reprinted in Daly, op. cit., and Allen E. Buchanan's "Assessing the Communitarian Critique of Liberalism," in *Ethics*, Vol. 99 No. 4 (July 1989), University of Chicago Press.

[12] Dewey discusses democracy as a social idea, distinct from democratic political institutions (that can take a variety of forms) in Daly, op. cit., pp. 154-156.

[13] Education presents us with formidable problems of its own. It might well turn out, however, that some of the same wrongheaded behaviors in matters of education (and their rectification) overlap those in matters of healing nature. It is to be hoped that along with work in many other areas we will be able to foster the conditions of a good life while there yet is time.

The Cleveland Worsted Mills: A Case Study in Lost Opportunities

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When the Cleveland Worsted Mills complex on Broadway Avenue was destroyed in a tremendous fire the morning of July 4, 1993, there were a number of losses. First and foremost was the destruction of the approximately 750,000 square feet of space in 22 structures which comprised the complex. Secondly, there was the destruction of neighbor properties and the threat to still more property and lives in the Broadway area. Of equal concern was the danger to the firemen and the further threat of loss of life to them and others at the scene of this disaster. Further down the list, but still of great importance was the loss and residual damage from the fumes and smoke emanating from the contents of the numerous unidentified drums of chemical products stored in the complex. Other loses included that of the funds needed to extinguish the fire, the clearing of the property, and ultimately the removal of toxic wastes–all of these being expenses borne by the City of Cleveland since clear ownership of the site could not be determined. Future costs will depend upon the level of toxicity of the site, removal of the toxins, the effects on human beings, and the costs to make the area a vital part of the community, not just an empty lot. There are probably other costs which also could be included in this listing.

What is evident is that the destruction by fire of the Worsted Mills was not just the result of a sudden torching of the complex, although that indeed did happen. The destruction came about because of neglect and missed opportunities over a long period, stretching back to 1957 when the Cleveland Worsted Mills ceased to function.

There is further irony in this situation in that the Cleveland Worsted Mills was a very progressive, prosperous enterprise which in its planning and existence was a model for addressing social concerns and advanced ideas of employee benefits. More than a prosperous firm and a good employer, the firm was a model of good community relationships during much of its existence.

The mills were established in 1893 as a result of the partnership of successful businessmen in the Broadway area. These individuals included Daniel Bailey, O. M. Stafford, Kaufman Hays, and Martin Marks. O. M Stafford pioneered the development of the Broadway Savings and Trust Co. and gave funds towards the construction of the Broadway Methodist Church whose Gothic style home is still a neighborhood landmark. Both Martin Marks and Kaufman Hays were tied very closely to the vast number of charities which today fall under the leadership of the Jewish Community Federation. These gentlemen espoused the ideals of philanthropy and community concern, which were important in the Progressive Era.

The firm these men founded, the Cleveland Worsted Mills, accepted raw wool and processed the yarn and, in turn, produced some of the finest lengths of worsted for use in making suits, coats and dresses in an era when such fabrics were in great demand. The firm had its major plant on Broadway, with its dyeing works (and company hotel) in Ravenna, Ohio; and mills in Camden, New Jersey; Philadelphia, Pennsylvania; Providence, Rhode Island; and Jamestown, New York. At times early in the twentieth century when Cleveland was either number two or three in the "rag" business (clothing), this firm supplied yard goods to such august firms as Joseph and Feiss, Richman's, H. Black, and the other leading manufacturers.

The Worsted Mills operated in a paternalistic fashion, yet with amenities well appreciated by its employees, most of whom were Czech and Polish residents from the immediate neighborhood. A day nursery, a sub branch of the Cleveland Public Library, and reading and recreational facilities (including sites for dances and concerts) were included in the facilities. The firm prided itself on the quality of its cafeteria (an innovation for the time) and provided other services as described in its employee magazine, *The Worsted News*. At the same time, because of the high demand for quality worsted, the mills prospered and in a way the Broadway area was a tight, small community much like Fall River, Lawrence, or other New England mill towns.

The end of this era of prosperity came after the Korean War. The war years of 1950-1953 were the last high point for the production of worsted. The loss of military contracts, the advent of synthetics, and most of all the threat of unionization which resulted in other firms first moving to the south and ultimately out of the country, marked the end of the worsted mills.

In 1957 the Cleveland Worsted Mills closed, its assets were liquidated, and the looms and other machinery were sold to the then emerging mills in West Germany.

The property, however, did not sit entirely empty. A number of small firms, especially those in trucking and warehousing which seemed to find the location and layout of the complex to their liking, moved into the Worsted Mills. Ironically, other tenants included small stores such as Dalton's, once a major producer of ladies garments in worsted.

By the early 1980s plans were formulated to market the former Worsted Mills complex as a sophisticated warehousing center. By the 1980s the mills were adjacent to both I-77 and I-480 and close to many of Cleveland's industries. It seemed as if the proximity of the mills to transport networks and manufacturers made it ideal for this new business venture.

Other proposals were made to find new tenants for the Worsted Mills. The 1970s marked the transformation of many similar mill complexes in New England and upper New York state into outlet malls where firms would sell seconds, overruns, samples, and odd lots in bare rooms devoid of show counters and fixtures normally seen in department stores.

These complexes attempted to return properties in such mill towns as Fall River and Lowell, Massachusetts, and Manchester, New Hampshire, and the Charlestown Mills complex in Utica, New York, into vibrant centers with a sound economic base. At each of these sites, local residents and especially tourists flocked to the mills looking for bargains and were happy with what they saw.

The new owners of the Cleveland Worsted Mills complex in the mid 1980s initiated plans to transform its Cleveland property into a similar operation which could have been realized with little effort. However, this redevelopment plan failed, and soon a pattern emerged of attempts at revitalization with little public support that were followed by still other plans which likewise never came to fruition. This pattern continued into the 1990s and the destruction of the mill complex.

The mill property was sold in the late 1980s to a Mr. Leonard Lesser, whose firm, Marlin Industries of Beverley Hills, California, operated the worsted mills site offering dead storage space while at the same time tried to obtain funds to provide a higher level of usage for the complex. Many projects and investors were involved with the mills during this period, and the property itself, according to county records, continued to change hands as options were extended and later revoked.

One proposal which was advanced by Mr. Lesser was for the development of the complex into light manufacturing areas, outlet stores, and warehouse space. This proposal went to the city of Cleveland for funding. The estimated costs for renovations were a high 40 million dollars, and Marlin Industries was looking to the City of Cleveland to provide 5 to 6 million dollars for the project.

There were two problems with this proposal. The first was the astronomical cost of the renovation. At a time when Forest City Enterprises through the Ratner family purchased the Terminal Tower for 13 million to become Tower City, it became clear these costs were greatly inflated. Secondly, the emphasis of the Voinovich administration in the City of Cleveland was on the rehabilitation of downtown structures, and the myriad of funds available to the city were being directed towards that end. Consequently the project got nowhere.

In the meantime, Marlin Industries neglected the dangers inherent in leasing space to tenants who stored items nobody knew of or cared to know. Secondly, in a decaying portion of the city any old structure became a target for arson. Eventually the City of Cleveland under the White administration realized the inherent dangers and began to evict the 20 tenants on the property and to determine who was responsible for the numerous 50-gallon unmarked drums stored in the complex.

Furthermore, by 1990 local development corporations (LDC's) became more active throughout the city. The community group in the Broadway area was the Slavic Village Association, which developed its own plan for the redevelopment of the mill complex. Their plan called for the conversion of 60 to 70,000 square feet as housing. The conversion to housing was a concept successful in other mills mostly in New England communities.

Unfortunately, while the plans of the Slavic Village Association worked their way through public agencies, arsonists became more active in their attempts to torch the complex, and finally on July 3, 1993, the work of yet unknown individuals was successful and the mill complex was destroyed.

The destruction of the complex was a stupendous loss to the community. Yet this event was even more tragic because there were lessons and attempts along the way to preserve the structures and to continue their role as vital parts of the community.

From many points of view the complex was worth saving. The Cleveland Landmarks Commission eagerly accepted the nomination of the mills for inclusion on the register of historic places, but was unable to provide this designation since the ownership of the mills was in question. Besides the architectural significance of the complex, the issues of the earnestness of owners and nonprofit organizations to modify the mills to serve new needs was never clearly addressed by public officials. In an era when the maintenance of jobs in local communities became a crucial issue in any city, this should have been a high priority for any city administration. In many ways the saving of the mills became impossible because of the problems of determining ownership, the avoidance of the problem of the future of the site, and the lack of foresight of both public and private bodies to understand the economic and social consequence of the continuation of the mills in a perilous state. As a result considerable funds have and will be expended along with the time and energy to make these activities happen to correct a situation which may have been avoided.

The Impact of Social and Physical Environment on Our Children and Youth

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I will be taking quite a different approach to the issue of environment from that of Professor Karberg. My concern is the social as well as the physical environment in which many young people in this country today are growing up.

About 20% of the children in this country are living in poverty. Many of their families are on welfare. They live in neighborhoods that no longer have the characteristics of a mutually supportive community. The families are often single parent families or when there are two parents, frequently both are employed and the children are at loose ends for significant portions of the day. They are exposed to violence in many forms such as homicide, largely due to guns, and child abuse, both physical, psychological, and sexual. Many of the able persons in the community are unemployed, and the educational system has trouble providing the quality of education that will adequately prepare children for the 21st century. In some of the larger city school systems, as many as 50% of the children drop out before graduating from high school. The school should provide a safe and stimulating environment, but it is often unable to assure the safety of pupils or teachers without screening for weapons and performing other measures that can be an unfortunate invasion of privacy.

In addition to the deficits in the social environment which amount to nothing less than a serious breakdown in the social structure as a whole, many of the neighborhoods in which children live, including the low-cost public housing in most communities, are ugly, characterized by empty stores and empty houses, some of which have been burned out but not yet demolished. The intact houses may be vandalized or occupied by squatters or serve as sources of lead for the children in the neighborhood. Parks, if they exist, are poorly maintained and unsafe, and graffiti are everywhere. Safety is a pervading concern, and too many of our children live in an environment of fear and insecurity. All in all, this is hardly an environment to foster intellectual growth or the development of potential contributors to the technological society of the 21st century, nor of loyal and participating citizens.

What can we do about this distressing situation? Obviously among the key issues are poverty and lack of employment which tend to lead to a sense of alienation and hopelessness. Gangs are a natural development since they provide for the adolescent in particular a sense of belonging and purpose which they do not find in other aspects of their lives. Obviously, the issue of jobs demands priority in our society, even if it means providing jobs in the public sector. The military has been a resource for many young people who lack other opportunities for advancement, but it is hardly the way to meet the overall problem. Various job training programs are available throughout the country, but they seem to meet a very small part of the problem. It has been proposed that a service corps be developed, comparable to what was established in the depression days which puts people to work dealing with public needs such as highway construction, conservation activities, and repair of the infrastructure in our cities which are in some areas badly deteriorating. Other efforts include developing stronger community organizations to take over management of their own affairs. This is not a new idea. It was a part of the poverty program in the 1960s, but does not seem to have been very successful in the past. A program is being conducted in Cleveland, for instance, that will establish within the city a series of "villages" or defined neighborhoods, each with semiautonomous grass roots government providing for more control by the residents over those aspects of their environment that affect their daily lives. This is being developed on an experimental basis in four areas in the city, and it will be interesting to see how successful it proves to be.

An assortment of programs have proved to be of value in promoting child development. These include Head Start for disadvantaged preschool children, school-based or school-linked health clinics (these have proved particularly effective for adolescents; the one in Cleveland at East High lacks adequate support), neighborhood community centers that provide a variety of services, monitoring programs, and many others. Although potentially effective, these programs are too few, often underfunded, and their support tends to be time limited. We are very far from meeting the need. There is no escaping the fact that in order to deal with what I regard as a serious crisis, monies will have to be spent, some of which may come by rearranging priorities, but almost certainly new monies will be required. Support needs to be flexible and comprehensive rather than strictly categorical as it mostly is now.

A key problem will be to develop these programs for the benefit of the community and not allow the bureaucratic structure to absorb the majority of the resources, which too often has been the case. As I indicated at the outset, this is a very different approach to environment than is the case with most of the groups and with the presentation by Professor Karberg. However, I firmly believe that this aspect of environment needs to be dealt with if our country is to remain competitive in the 21st century.

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Can Satisfaction Be Found in Poor Neighborhoods? The Case of Cleveland's Elderly

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A major societal concern today is poverty and its deleterious effects on our potentially vulnerable populations of children and elders. Considerably more is known about the effects of poverty on children's behavior and affective states than on those of older people. Specifically, there is a dearth of literature that concerns itself with the effects of geographically concentrated poverty on older Americans. This is an important area of concern because of two intersecting facts. One, poverty is spreading geographically, as well as becoming more concentrated in certain neighborhoods. The second fact is the unprecedented rapid growth of the elderly population. The intersection of these two facts is that the elderly are the adult cohort most likely to live in poverty and poor neighborhoods.

Given the intersection of these two facts, this paper addresses a pertinent question: What effect on elders' residential satisfaction and subjective well-being, if any, does living in urban neighborhoods of high, persistent poverty have? A study of Cleveland's older residents was conducted in 1991-92 to answer this question. Person-environment interaction theory provided the theoretical basis for this study.

Background

Briefly, person-environment interaction (PEI) theory asserts that there is a reciprocal relationship between a person and the environment. People are shaped in part by their environment, and through their behavior people alter their environment. Additionally, the degree to which the environment influences the individual depends on the person's level of competence (ability to function). Individuals have competence in multiple spheres, including health, physical functioning, self-esteem and cognitive skills (Lawton & Nahemow, 1973). A person with compromised competence will be influenced more by the environment. For instance, a person who has decreased skin sensitivity for temperature extremes must rely more on environmental indicators of temperature and make the necessary adjustments in room temperature or clothing. A person's behavior and affective states are indicators of the interaction between self and the environment.

Using person-environment interaction theory, the Urban Ecological Model of Aging (UEMA) (Brown, 1993) was developed primarily to determine the effects of the suprapersonal environment of poor urban neighborhoods on elderly residents (see Figure 1). According to Lawton and Nahemow (1973), the suprapersonal environment is the aggregated characteristics of people who inhabit a particular area. For instance, the prevalence of neighborhood juvenile delinquency is a suprapersonal environment characteristic. The Urban Ecological Model of Aging contends that people's perceptions of their suprapersonal environment influence personal appraisals of subjective well-being both directly and through personal appraisals of residential satisfaction.

Subjective well-being (SPE), the dependent variable in the UEMA, is an affective state characterized by positive and negative dimensions (Watson, Clark & Tellegen, 1988). Positive affect (PA) encompasses level of enthusiasm, alertness, and activity. Negative affect (NA) is level of anxiety, fear, and anger.

Specific Suprapersonal Environment Characteristics of poor neighborhoods hypothesized to influence elders' SWB are objective and perceived neighborhood poverty type (official and personal evaluations, respectively, of the degree and duration of poverty in the neighborhood) and perceived negative social conditions in the neighborhood (problems prominently covered by the media, and prevalent in some impoverished communities). These six negative social conditions based on the UEMA are 1) juvenile delinquency, 2) fear of victimization, 3) welfare dependency, 4) unemployment, 5) female-headed households without support from the father, and 6) births to teenagers, and perceived neighborhood age homogeneity (majority of neighbors thought to be elderly).

The literature indicates that residential satisfaction (i.e., level of satisfaction with one's living conditions) shapes one's subjective well-being and is thus included in the Urban Ecological Model of Aging. There is research also to substantiate the predictors of residential satisfaction and SWB shown in the UEMA grouped as Characteristics of Elder Vulnerability: 1) demographic characteristics [age, sex, race, marital status, income and education], along with personal perceptions of 2) level of physical functioning regarding activities of daily living [bathing, dressing, feeding etc.], 3) perceived and received social support [help available when needed], and 4) dwelling characteristics [age of home, ownership/tenure, number of bathrooms, and length of residency.

People reporting higher residential satisfaction are white, married, living in newer homes with multiple baths, homeowners, and shorter term residents. Age, sex, income and education are inconsistent predictors of residential satisfaction. People reporting higher SWB have good physical health, high socioeconomic status, a spouse, modern home, and social support. Race and sex are inconsistent predictors of subjective well-being.

Previous researchers have not defined aspects of the suprapersonal environment of poor urban neighborhoods thought to have an impact on elders' residential satisfaction and subjective well-being. Therefore, the Urban Ecological Model of Aging is unique in that it does set forth SPE parameters. Based on the model, elders' perceptions of the following SPE characteristics are hypothesized to be predictive of residential satisfaction and SWB: 1. Perceived neighborhood poverty type–low degree and short duration of poverty associated with high PA and residential satisfaction, and low NA; 2. Low percentage of perceived neighborhood negative social conditions associated with high PA and residential satisfaction, and low NA; 3. Perceived neighborhood age homogeneity–perception that majority of neighbors are elderly associated with high PA and residential satisfaction, and low NA.

While elders' perceptions are in part based on objective information made available to them through the media, it is the filtering of this objective information through one's thought processes to form perceptions that are hypothesized to be more relevant to personal appraisals of residential satisfaction and SWB.

Method

A stratified random sampling procedure was used to select subjects. Census tracts in 32 of Cleveland's 35 Statistical Planning Areas (SPA) were sampled. Three SPAs were eliminated from sampling because of insufficient population (less than 5,000 residents) or because they were predominately Hispanic (subject requirement was English as primary language). The 32 SPAs were stratified according to east-side or west-side location. In Cleveland, the east-side is more populous than the west, and the west is predominately white.

Cleveland's census tracts were then stratified into one of three types of high poverty neighborhoods using the 1990 Census Tract Guide for Cuyahoga County and a typology of high poverty neighborhoods developed by Coulton and her associates (1991). (This was also the procedure to operationalize the objective neighborhood poverty type concept in the UEMA.) The typology distinguishes between three types of high poverty neighborhoods and includes a low poverty category. Neighborhoods are defined as high poverty when 40% or more of its residents fall below the federal poverty threshold. Low poverty neighborhoods have 20% or fewer such residents.

Then census tracts were selected based on east side or west side location and objective poverty type. Next senior citizen centers servicing the selected census tracts were identified. Then the centers were visited by the researcher to obtain volunteers.

One hundred and ninety-six elders 60 years of age or older, who were residing in the city of Cleveland (of the 274 approached to become subjects) and who were randomly selected to participate in the study from Senior Citizen Centers and referral by seniors and staff at the centers, agreed to participate. This represents a 72% agreement rate, and a 28% (78) refusal rate. Thus, some study subjects used center services, and some did not. A 92-item questionnaire developed by the researcher was administered by phone. Established scales where available were incorporated into the questionnaire (this includes scales for Positive Affect and Negative Affect, social support, physical functioning, and neighborhood poverty type).

Multiple regression statistical technique was used to analyze the data, with positive affect, negative affect, and residential satisfaction as separate dependent variables. Positive affect and negative affect are conceptualized as two separate dimensions of SWB and hence should be analyzed separately.

Results

On average, the questionnaire required 25 minutes (SD 9), to complete over the phone. The sample profile was:

> Mean subject age 73 years, SD 8; 62% black, 38% white; 83% female, 17% male; 52% widowed, 18% married, 17% divorced, 7% single never married, and 6% separated; 63% less than high school education; 55% retired; 61% lived alone; 60% of those living with other(s) were head of household; 54% were renters; 78% lived in homes at least 30 years old; 84% lived in private housing. The average length of residency was 22 years, SD 17. For 1991, 58% had one source of income, with 46% relying solely on Social Security. Eighty-four percent (84%) reported income in the less than $10,000 range.

The statistically significant results are depicted in Figures 2 and 3. Furthermore, multiple regression adjusted R^2 show that the UEMA accounts for 25% of the variability in PA, 32% in NA, and 28% in residential satisfaction. Basically, PA, NA and residential satisfaction have different predictors. The primary predictors as a group are from the characteristics of elder vulnerability as opposed to SPE characteristics. For residential satisfaction, the predictors from elder vulnerability characteristics are perceived social support, received social support, dwelling age, and tenure. That is to say, older people who had social support, lived in newer homes, and owned their homes experienced more satisfaction with their place of residence. Furthermore, only one of the six negative social conditions from the SPE, perceived neighborhood victimization, is predictive of residential satisfaction. Elders who thought that many of their neighbors had been crime victims reported lower residential satisfaction.

Likewise, the characteristics of elder vulnerability that predict PA are sex, income, education, and perceived social support, which means that higher levels of positive affect were experienced by women, people with higher socioeconomic status (i.e., income and education), and those who thought they would have social support if needed. And for NA, the predictors from elder vulnerability characteristics are sex, race, ADL, and number of bathrooms. Hence, women, whites, people with physical limitations, and multiple bathrooms reported more feelings of anger, anxiety, and fear.

In contrast, only one SPE characteristic, perceived neighborhood female-headed households without support from fathers, is predictive of PA. Elders in neighborhoods that they perceived to have high levels of female-headed households without support from fathers reported more feelings of enthusiasm, alertness and activity. And only one SPE characteristic, perceived neighborhood unemployment, is predictive of NA. Elders in neighborhoods seen as having high levels of unemployment experienced more NA. Additionally, residential satisfaction is predictive of NA but not PA.

Discussion

The results indicate, contrary to the Urban Ecological Model of Aging predictions that all the aspects of the SPE do not exert demands on the person, at least not to the extent that the researcher was able to observe corresponding decreases in either residential satisfaction or Positive Affect, or increases in Negative Affect. There are several possible explanations for these findings.

First, the elders most negatively affected by the SPE that exists in impoverished neighborhoods may have already migrated out from those neighborhoods. Census data reveal that there has been an appreciable decrease in Cleveland elders in the past decade (Coulton et al., 1991). But reasons for leaving are largely left to speculation, due to lack of follow-up study of these specific migrants from Cleveland. It is plausible that the majority of elders remaining in the inner city may be those who are generally satisfied with their homes and neighborhoods and/or best able to cope with the SPE of poverty neighborhoods.

Second, the findings may have been unduly influenced by the operationalization of the SPE neighborhood poverty types concepts. Neither objective nor perceived neighborhood poverty type directly affected any of the outcomes of interest. The objective and perceived neighborhood poverty type concepts were based on 1) the percentage of poverty in the neighborhood and 2) the length of time that level of poverty had existed. When these two variables are used to classify objective neighborhood poverty type, U. S. Census data are used. As such, these two variables are likely measured with relative accuracy. However, when these two variables are used to classify perceived neighborhood poverty type, the individuals' perceptions are used. Consequently, it is likely that these two variables are measured with less accuracy. For the perceived measure to have meaning, the level of poverty in the neighborhood must be salient enough to the respondents such that they may offer an estimation of its extent. Additionally, the respondents are required to have knowledge of the neighborhood's history of poverty to enable them to say how long a given level of poverty has existed. This history might be especially difficult to know if the respondent has not been a resident of the neighborhood since 1970 (the most extreme high poverty group has had at least 40% poor since 1970, by definition).

The potential for error in these perceived estimation components may be great, especially for the component dealing with the duration of neighborhood poverty. The data are consistent with the suggestion that such errors in judging neighborhood poverty types may have occurred. Dividing the sample into subsamples based on objective neighborhood poverty type, residents of high poverty areas correctly perceived that their neighborhoods have a poverty level of 40% or more (i.e., the neighborhood is in fact a high poverty one). However, they do not accurately know how long that level of poverty has existed in the neighborhood. In other words, poverty level has personal salience, but the poverty duration aspect of the neighborhood's history is not well known. If the perceived poverty level is used (i.e., without the duration component) to determine neighborhood poverty type, then it is possible that perceived neighborhood poverty type would have a demonstrated effect on residential satisfaction and SWB.

A third possible explanation for the failure of the SPE to affect residential satisfaction and SWB could be that the "reference" neighborhood for the sample of elderly was not the neighborhood of residence. In other words, the elders may have had significant roles they played in neighborhoods outside their neighborhood of residence. For example, older persons who spend extensive time periods in the suburban homes of their children may have used those neighborhoods as their reference group. Further, these roles and associated relationships in other neighborhoods may have been more important to the elders, such that these outside neighborhoods were in fact their reference neighborhoods. If this is the case, it would be more appropriate to study the impact of the SPE of these non-residential reference neighborhoods on residential satisfaction and SWB.

A fourth possible explanation for the failure of the SPE to affect residential satisfaction and SWB concerns the ability of these elders to cope with potentially stressful situations. Subsequent to their competent coping, the negative neighborhood effects may have been diminished. For example, elders who perceived a high rate of victimization of neighbors in their neighborhood might limit running errands to the early part of the day when they feel safest. This strategy would minimize the likelihood of their becoming crime victims.

It is very interesting to note that the one SPE characteristic that did influence PA, female-headed households without support from fathers, did so in a direction opposite of the hypothesized direction. Instead of lowering one's positive affect living among these neighbors, PA was increased. This finding may indicate that seeing others cope with adversity improves positive affect. Perhaps elders in these neighborhoods provide some type of assistance to such households, and make them feel needed and valued, thus enhancing their positive affect.

Certainly at this point, more research is needed to further test the Urban Ecological Model of Aging, perhaps with a slight change in the operationalization of the neighborhood poverty type construct as indicated above.

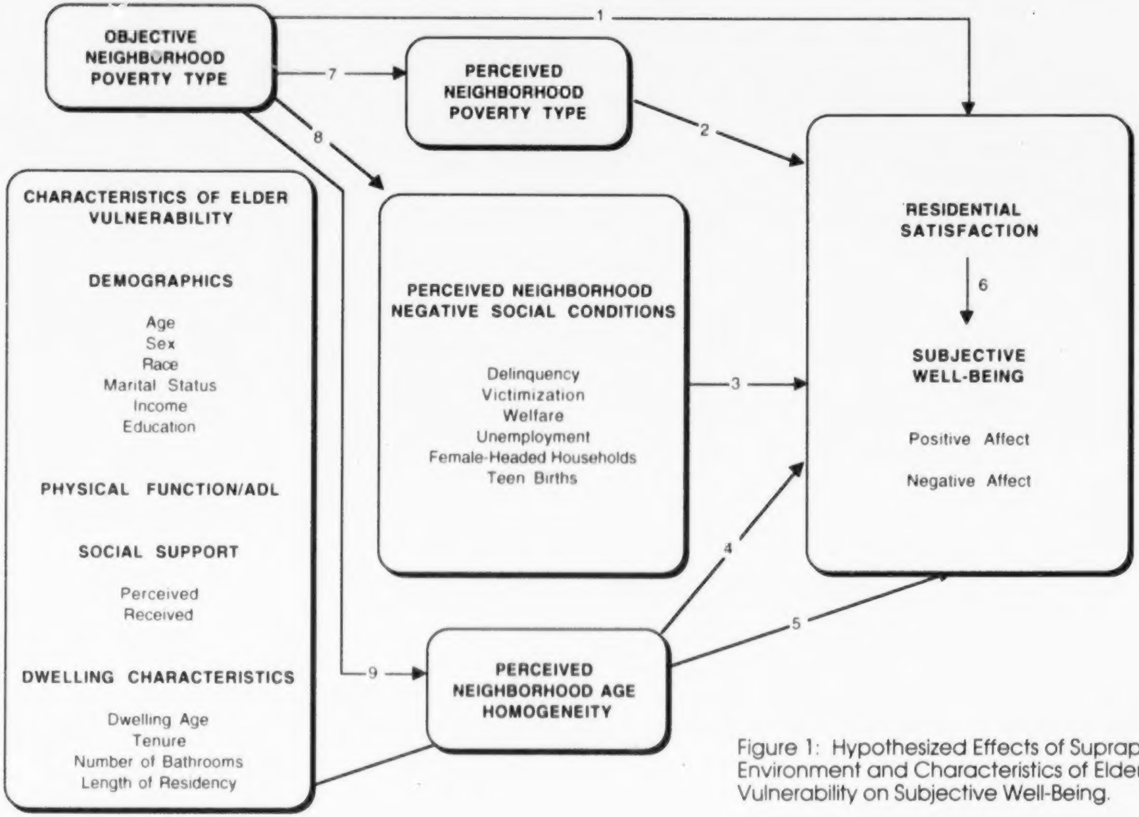
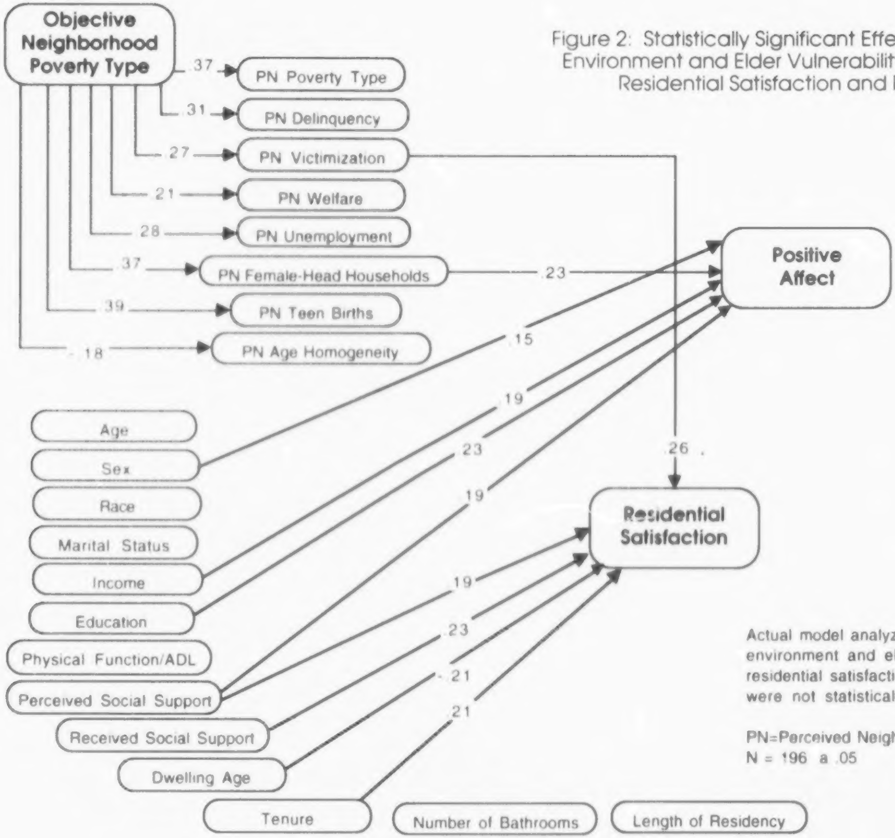

OBJECTIVE NEIGHBORHOOD POVERTY TYPE
PERCEIVED NEIGHBORHOOD POVERTY TYPE
CHARACTERISTICS OF ELDER VULNERABILITY
DEMOGRAPHICS
Age
Sex
Race
Marital Status
Income
Education
PHYSICAL FUNCTION/ADL
SOCIAL SUPPORT
Perceived
Received
DWELLING CHARACTERISTICS
Dwelling Age
Tenure
Number of Bathrooms
Length of Residency
PERCEIVED NEIGHBORHOOD NEGATIVE SOCIAL CONDITIONS
Delinquency
Victimization
Welfare
Unemployment
Female-Headed Households
Teen Births
PERCEIVED NEIGHBORHOOD AGE HOMOGENEITY
RESIDENTIAL SATISFACTION
SUBJECTIVE WELL-BEING
Positive Affect
Negative Affect
1
2
3
4
5
6
7
8
9

Figure 1: Hypothesized Effects of Suprapersonal Environment and Characteristics of Elder Vulnerability on Subjective Well-Being.

Figure 2: Statistically Significant Effects of Suprapersonal Environment and Elder Vulnerability Characteristics on Residential Satisfaction and Positive Affect.


Objective Neighborhood Poverty Type
.37
PN Poverty Type
.31
PN Delinquency
.27
PN Victimization
.21
PN Welfare
.28
PN Unemployment
.37
PN Female-Head Households
.39
PN Teen Births
-.18
PN Age Homogeneity
.23
Positive Affect
.15
.19
.23
.19
.26
Residential Satisfaction
Age
Sex
Race
Marital Status
Income
Education
Physical Function/ADL
Perceived Social Support
Received Social Support
Dwelling Age
Tenure
Number of Bathrooms
Length of Residency
.19
.23
-.21
.21

Actual model analyzed included paths from all suprapersonal environment and elder vulnerability characteristics to residential satisfaction and positive affect. Paths not shown were not statistically significant, p >.05.

PN=Perceived Neighborhood
N = 196 a .05

83

84

Valerie Brown

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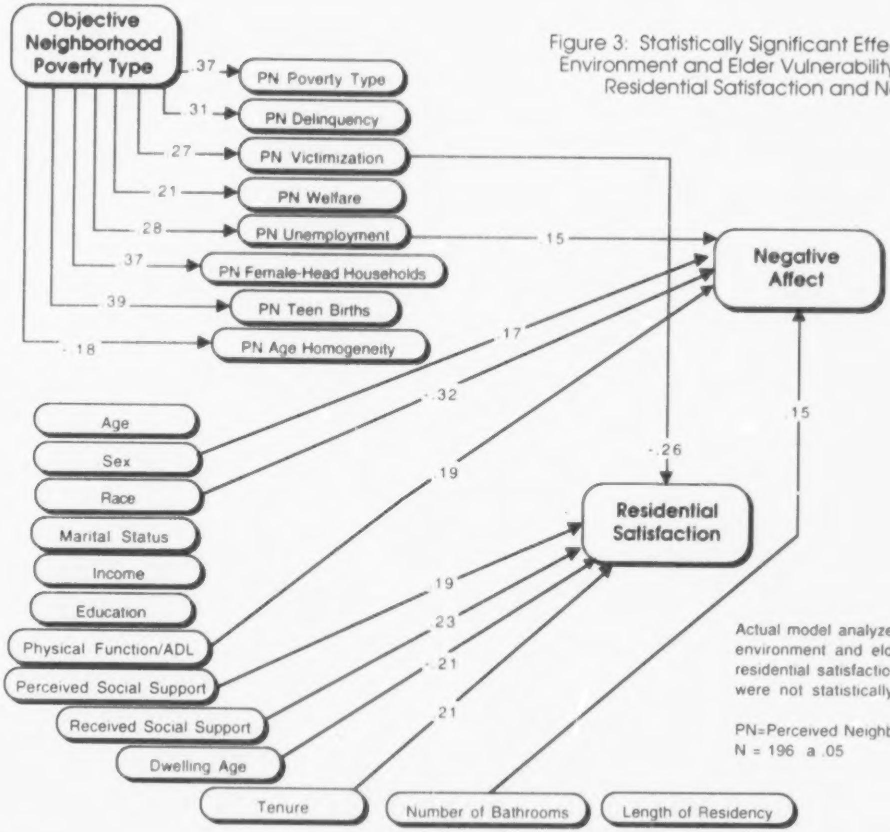
Figure 3: Statistically Significant Effects of Suprapersonal Environment and Elder Vulnerability Characteristics on Residential Satisfaction and Negative Affect.


Objective Neighborhood Poverty Type
.37
PN Poverty Type
.31
PN Delinquency
.27
PN Victimization
.21
PN Welfare
.28
PN Unemployment
.15
.37
PN Female-Head Households
.39
PN Teen Births
-.18
PN Age Homogeneity
.17
Negative Affect
-.32
.15
-.26
Age
Sex
Race
.19
Marital Status
Income
Education
Physical Function/ADL
Perceived Social Support
Received Social Support
Dwelling Age
Tenure
Number of Bathrooms
Length of Residency
Residential Satisfaction
.19
.23
-.21
.21

Actual model analyzed included paths from all suprapersonal environment and elder vulnerability characteristics to residential satisfaction and positive affect. Paths not shown were not statistically significant, p >.05.

PN=Perceived Neighborhood
N = 196 a .05

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Urban Children at Risk

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While many children in this nation are growing up relatively safe and healthy, an increasing number of American children find themselves in environments that put them at high risk of adverse outcomes. During the past twenty-five years, considerable research effort has been devoted to the identification of specific risk factors and the study of their role in the production of such destructive outcomes as school failure, juvenile crime, and adolescent childbearing. A risk factor is considered to be any characteristic of the individual or environment that increases the likelihood of negative health, developmental, and educational outcomes. It may be biologically based, such as fetal drug exposure or low birth weight; it may be familial, such as an alcoholic or rejecting parent; or it may be socioeconomic, such as poverty or chronic exposure to violence. Considerable progress has been made in the identification of the risk factors that tax the adaptive capabilities of individuals and families to the point where health and psychological well-being are compromised. Researchers using a variety of methodologies and subject populations have reported an extraordinary convergence of findings, with risk factors implicated in one adverse outcome often being involved in other adverse outcomes as well. Study after study has found the most unrelenting and pervasive risk factor of all to be chronic poverty because virtually all other risk factors associated with negative outcomes are found disproportionately among poor children, especially children whose families live in urban areas of persistent and concentrated poverty.

Poor urban children usually experience much more life stress than do their middle class counterparts. In addition to the financial uncertainty associated with poverty, they are more likely to experience strings of negative events such as parental job loss, eviction, illness, criminal assault, and chronic problems such as overcrowded or substandard housing, dangerous neighborhoods, and poor health care. The effect of such stresses is reflected in the fact that poor children are more likely than middle-class children to be considered learning disabled, to drop out of school, to spend time in a correctional institution as a juvenile, to be diagnosed as having a mental disorder, and to have a variety of other behavioral and emotional problems.

The poverty rate in the United States for children under the age of 18 has soared in the past 20 years so that more than one in five children (Children's Defense Fund Staff, 1992a) now live in poverty, as defined by the federal government, but the rate in large cities such as Cleveland is much higher, with 43.0% of all the city's children living in poverty (Council for Economic Opportunities in Greater Cleveland, 1992). The younger the child, the greater the likelihood of being poor. In some areas of the city of Cleveland, the 1992 poverty rate for children ages three and four exceeds 90% (Council for Economic Opportunities in Greater Cleveland).

For poor urban children, major developmental risks often are faced even before birth. Mothers who are poor are less likely to have early prenatal care that includes screening for diabetes and hypertension and counseling regarding drug abstinence and nutritional requirements. As a result, many poor babies start life irritable, sickly, at a low birth weight, and at increased risk of mental retardation, cerebral palsy, hearing and vision problems, and other physical and mental disabilities. Low birth weight infants comprise nearly 60% of infant deaths in this country (Real, 1991). In addition, children who start life with a birth weight below 5.5 pounds are more likely to be enrolled in special education classes, have learning disabilities, and experience difficulties in school. Thus, it is particularly disturbing that the low birth weight rate in Cuyahoga County has climbed over the past several years to 9.8% of all live births (Children's Defense Fund Staff, 1992b).

Exposure to drugs and other damaging environmental influences during prenatal development further jeopardizes the future of a disproportionate number of poor urban children. Alcoholics who continue drinking heavily and addicts who continue using drugs during pregnancy are at high risk of bearing children with central nervous system damage, low IQs, hyperactivity, learning problems, and a variety of severe malformations. Some large city hospitals across the nation report that over 20% of their deliveries are infants with prenatal exposure to illegal drugs (Sautter, 1992). Exposure to the HIV virus is associated with intravenous drug use and in some areas, such as New York City where there are many intravenous drug users, one in every 80 births involves an HIV-infected woman (Novick, Berns, Stricof, Pass, and Wethers, 1989). Approximately 30% of infants born to HIV-positive mothers become infected themselves (Koop, 1986).

Children who are poor suffer more accidents and are less likely to receive immunizations, regular health care, and proper nutrition. The higher accident rate reflects the unsafe conditions they encounter which render them more likely to drown, suffocate, or be injured in a fire. Non-immunized children risk neurological complications from such preventable childhood diseases as whooping cough and measles. The most common consequence of poor nutrition in children is iron-deficiency anemia which is associated with slow development in infants, inattention among school-age children, and conduct disorders in adolescents. Lead poisoning occurs with alarming frequency among preschoolers and has been called "the No. 1 environmental threat to the health of children in the United States" (Health and Human Services Secretary Louis W. Sullivan in Cooper, 1992, 1A). Its effects include hearing loss, slower reaction times, reduced attentiveness, problems with balance, irreversible learning disabilities, neurological disorders, mental retardation, and blood and kidney disorders. Nationally, as many as 15% of preschoolers may suffer from such disorders. Locally, in 1992 Cleveland was ranked fourth highest in the nation with 64.7% of children between the ages of six months and five years having blood-lead levels above the government's threshold for lead poisoning (Cooper, 1992).

Homelessness is a devastating experience for children who lose a sense of security and continuity. The U.S. General Accounting Office conservatively estimates that 68,000 (Linehan, 1992) children in this country are homeless on any given night. Again, the young child is particularly vulnerable since single mothers with young children are the most rapidly growing segment of the homeless population. These children are prone to restlessness, aggressive behavioral problems, learning problems, regressive behavior, inattentiveness, hyperactivity, persistent tiredness, anxiety, and depression. The statistics on homeless children are based on counts of the people served by the shelter system, but in addition to these families there are nearly 14 million families (Combating Homelessness, 1989) who have temporarily moved in with friends and family, often producing overcrowded, noisy, and disorganized living conditions where children are unable to find the solitude to do homework, to reflect on the day's events, or to maintain a sense of privacy and personal possessions.

Families headed by single women with children are the poorest of all major demographic groups In 1992, 27% of children in the U.S. lived with one parent, almost always the mother, but these children made up 64% of all children in poverty Only 10% of children in two-parent families are poor, but more than half of children without fathers live in poverty (U. S. Census Bureau, 1992). Children in single-parent homes are also likely to stay poorer longer: 22% of children in one-parent families will experience poverty during childhood for seven years or more, as compared with only 2% of children in two-parent homes (Whitehead, 1993). There are differences among single parents, with 28% of widowed mothers living in poverty, 37% of divorced mothers, and 66% of never-married mothers being poor. Dramatic increases in the number of families headed by never-married females are reflected in the fact that more children become poor each year through birth to an unmarried woman than through divorce (U.S. Census Bureau, 1992).

Teen births have also increased in this country, with 533,483 babies born in 1990 to mothers under the age of 20, including 194,984 to girls 17 and younger (Frolik, 1994). Only half the teen-age mothers obtained prenatal care in the first trimester of pregnancy, compared with 76% of all mothers. Young motherhood is often coupled with other risks; as Mark Real of the Children's Defense Fund points out, "Ohio's teen parents are younger, poorer, less educated, and more likely to be unwed than ten years ago" (1991). Their children are at greater risk of being born prematurely and at low birth weight, of falling behind in school and being suspended or dropping out of school, of starting sexual activity earlier than their peers, and of having children while still adolescents.

Each risk factor–whether it be chronic or acute; prenatal, perinatal, or postnatal; personal, familial, or societal–increases the risk of adverse outcomes but, when multiple risk factors are present concurrently, as for example, when a child of low birth weight is raised in an environment of poverty, the risk increases many times over rather than simply being the sum of the individual risk factors. Each stress seems to potentiate the others. A classic epidemiological study by Michael Rutter (1989) on the Isle of Wright and the inner city of London found that the rates of psychiatric disorder in children were a function of the number of familial risk factors to which the child had been exposed, including such factors as overcrowding in the home, low socioeconomic status, severe marital discord, parental criminality, and mental illness of a parent. Two stressors, operating concurrently, increased the risk of a serious disorder fourfold; four or more simultaneous family risk factors resulted in a tenfold increase in the rate of disorders. Other studies that allowed for multiple risk factors found similar interaction effects in such diverse populations as children reared in chronic poverty (Werner, 1989), children living in a downtown metropolis (Gersten, 1977), children who have been physically abused (Kruttsnitt, Wrd, and Sheble, 1987), and urban preadolescents experiencing high stress (Wyman, Emory, Work, and Parker, 1991). Escalona (1982) found very low IQ scores were most common among school children who had low birth weights and were raised in poverty, but low birth weight children reared in middle-class families developed essentially normal IQs, as did normal-weight infants reared in poverty-level families. It was the combination of low birth weight and social and economic deprivation that accounted for the high rates of later cognitive and social impairment. On the positive side, if a parent, teacher, social worker, or concerned adult can eliminate or reduce even one risk factor, the overall risk for that child may be reduced substantially. To help a child it is not necessary to remove every risk factor. Such a realization can be both a comforting and motivating thought to an adult who witnesses a child struggling with what seems an insurmountable number of stresses and adversities, some of which may be beyond the adult's ability to change.

While children who are subject to multiple risks have a greatly increased likelihood of developing one or more negative outcomes, it is by no means an automatic consequence. On the contrary, many children at risk, even those who begin life under conditions of considerable prenatal stress and grow up in the most unfavorable of environments, evidence coping and mastery to become happy, competent adults. Psychologists refer to such children as "resilient" or "stress-resistant," and to factors that enhance resilience as "protective factors." (An earlier term applied to these children was "invulnerable," but this term is misleading because every child has a limit in terms of the stresses that can be withstood and the number of risks that can be surmounted. Therefore, the term "invulnerable" is no longer commonly used in this area of research.) Psychology, with its historical emphasis on illness as opposed to health, knows more about stress-affected children than about stress-resistant children who cope and adjust well under high risk situation. However, in the past decade or so, psychologists have searched for the protective factors that differentiate stress-resistant children from others. Several such factors have been identified, some having been found to lie within the child him- or herself, some within the family, and others outside the family.

Resilient children are likely to have an easygoing temperament, generally having been flexible, adaptable, sociable, and of a positive mood since birth. These temperamental qualities impact on interpersonal interactions as they prompt the child to approach other people and help the child elicit positive responses from others, both of which may serve to reduce stress. Children with easy temperaments are more likely to develop secure attachments to their caregivers and to be at less risk of child abuse. Such findings regarding the influence of temperament do not imply, however, that individual differences in reactions to adversity and stress are due solely to the effect of inherited constitution. There is a complex interactive process at work between genetic and experiential factors, with temperamental qualities operating in part through their effect on the environment and in part on other people's responses to the child. For example, so-called difficult babies who are nonadaptive, irregular in rhythms or patterns, and of a generally negative mood, are at risk of developing an insecure attachment with the primary caregiver, usually the mother, because they demand much and offer relatively few positive reinforcers in return. However, these children are much more likely to develop a secure attachment if the primary caregiver has adequate social support from others whom she can call on for help and advice. Furthermore, "difficultness" of temperament is not an absolute quality, but rather a relative and personal judgment rendered by each individual who interacts with the child. Character traits that one parent or one family finds difficult may be regarded positively by another. Thus, the relationship between temperament and later outcome or vulnerability is not at all inevitable. A supportive, accepting, low-stress environment may allow a temperamentally difficult, and hence vulnerable, child to move through the stages of childhood development without difficulty. As the environment can ameliorate, so can it potentiate vulnerabilities. Even the easiest of babies is at risk of an insecure attachment and general disorganization and distress when raised by a depressed mother who is slow to respond to the infant's needs and is negative if not hostile to the infant. Temperamental qualities that serve a child well at one point in development and in one set of circumstances may not do so at another time and place. For example, in poor quality institutions, a high activity level may be of benefit to infants if it elicits stimulating interaction with the staff although activity level may be unrelated to successful adjustment in other environments.

A supportive family milieu is perhaps the greatest protective factor in childhood. Children who have a good relationship with at least one parent tend to do better than those who do not. The period from roughly six to eighteen months may be particularly important in the development of a secure emotional attachment to a person and a sense of basic trust in the world. The attachment figure need not necessarily be a parent; sometimes an older sibling, grandparent, baby-sitter, or other doting adult can provide the responsive and warm support that sets the stage for later positive development in the face of major risk factors.

Stimulation from both within and outside the family can be a significant moderator variable in determining the effects of risk factors. Werner (1989) in a longitudinal study of the children of Kauai found moderate central nervous system abnormalities present at birth disappeared by age 10 in children raised in stable and supportive environments, but were exacerbated in children from families that were unstable, poorly educated, or of low income. A combination of stimulation and support seemed to enable the child to compensate for the biological abnormalities, while the stress and environmental insufficiencies of an impoverished home allowed minor defects to become major. In some cases, social and cognitive stimulation from sources outside the family, such as early compensatory education programs, may provide beneficial compensatory cognitive and social stimulation. Breitmayer and Ramey (1986) found that infants who were at risk of mild mental retardation because of a nonoptimal biological status (APGAR less than 8) at birth and a disadvantaged home environment, performed in the normal range on IQ tests at age four and a half when exposed to highly stimulating, specially designed preschools but had significantly lower IQs if reared at home by mothers with little education.

Poverty is often accompanied by social isolation, and yet social support of both parent and child can serve as a buffer against the effects of various stressors. Stress resistant children are likely to have parents who report more child care support and involvement from the father and extended family (Werner, 1989; Wyman et al., 1991). Social support, whether from family and friends or from formal support groups and service agencies, may well determine whether an unemployed, adolescent high school dropout will be accepting, responsive, and affectionate toward her child, or hostile, indifferent, and rejecting. Unfortunately, social isolation tends to be greatest in poor neighborhoods where everyone is stressed and few have energy to respond to the needs of others. Social support is also important for the child as it serves as a buffer against stress. Many resilient children have informal support networks with peers and adults outside the nuclear family, such as teachers, coaches, and YMCA leaders who supply advice and aid. They get involved with hobbies and outside interests or activities that serve as a refuge from family problems and provide both solace and a sense of achievement. For example, good experiences at school, whether in terms of social relationships, athletic competition, musical performance, or academic excellence, are powerful protective factors. Success in one arena of life leads to enhance self-esteem and feelings of self-efficacy which enable a child to deal more effectively with subsequent life challenges. In fact, long-term benefits of positive school experiences may result as much from the positive effect on children's self-esteem and task orientation as from the specific information they are taught. A sense of self-efficacy and control allows an individual to act positively and cope more successfully; a sense of shame and helplessness promotes alienation and hopelessness, as one adversity leads to another, and failure follows upon failure. Personally meaningful rewards and achievement in an area, whatever it may be, goes a long way toward offsetting problems in other areas.

Might the experiencing of some adversities and stresses actually strengthen the child who faces early poverty, neglect, and adversity, and so better prepare him to withstand the adversity that he will experience as an adult? This is sometimes referred to as the "steeling effect"–as steel is tempered with heat, so it is proposed that a bit of unpleasant and even potentially harmful stress might toughen character. Indeed, there is limited evidence of such an effect. Assumption of responsibility such as the helping of a sick parent or younger sibling, sometimes leads to heightened morale and development of new problem-solving skills. If the stresses are both manageable and of a kind that gives rise to productive and rewarding tasks, the net effect of the stress may be beneficial. However, most of the stresses encountered by the child of poverty is of the kind that is overwhelming, both in number and intensity, and as such is more likely to have a sensitizing effect as it creates a mental set of hopelessness, helplessness, or rage.

The key, then, for every child and at every stage of development, lies in the dynamic balance between risk factors and protective factors, between experiences and characteristics that heighten vulnerability and those that enhance resilience. As long as the balance is favorably weighted toward protection, successful coping can result. If, however, the balance is unfavorable, with the weight of stresses exceeding that of protection, negative outcomes with long-term consequences are likely even for the most resilient of children. Interventions may be able to shift the balance, either by reducing the number of risk factors or by strengthening the contribution of the protective factors. Ultimately, the goal in the study of resilient outcomes in highly stressed children is to learn how to develop preventive strategies and interventions for the more vulnerable. At present, there are no definitive causal theories and no quick fixes. However, the convergence of findings concerning the importance of family milieu and early parent-child relationships suggests that effective programs need to work with high-risk families, not just children, to help create child-rearing conditions that promote resilience, with priority being given to infants and children who are especially vulnerable because they lack the opportunity to form strong and loving bonds with caring adults–social bonds that help to buffer the effects of current and future stress. The challenge now is to create a national policy that meets the needs of American children, their families, and the needs of the nation as a whole.

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The Availability of Firearms and the Impact of Violence By and Against Children and Youth

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As we look ahead to a new century and the character of our social environment we are in fact reflecting on the kind of world we have built for our children. Therefore, we should also consider what it means to be a child in the United States at the close of the 20th Century.

The primary social environment for the child is the family, and for the family it is the community. Child health and community integrity are linked in such a fashion that only in vital communities can the best interests of children be realized. (1) These interests include not only physical health and safety but also emotional, intellectual and spiritual well-being. The impact of violent acts committed by children and youth and against children and youth has resulted not only in an increased morbidity and mortality among this segment of the population, but also an influence on their world view. These perceptions children carry with them into adulthood, and they will eventually be reflected in the social environment they create for their own children.

There is evidence which suggests that children who witness violence alter their world views in significant ways. For example, they are more inclined to perceive the world as a hostile place and to experience their vulnerability to harm to a degree that exceeds age-appropriate fears. (2) Children are angry at the failure of adults to protect them. (3) This may explain in part why they view violence against their peers as a normative, acceptable way of resolving conflict.

In the United States firearms have become readily available instruments of violence. This particular aspect of our social environment will be the focus of this paper, specifically addressing our underlying beliefs about the right of individuals to possess these weapons and the impact of their use on the health of children and young people.

The "Right" to Bear Arms

The availability and use of firearms by the general population of the United States for reasons not related to the military is unique among industrialized nations. For example, a comparison of seven nations reveals the following numbers of handgun deaths in 1990:

10	Australia
13	Sweden
22	Great Britain
68	Canada
87	Japan
91	Switzerland
10,567	United States (4)

Even accounting for the larger total population of the United States as compared to other countries it is obvious from these numbers that there is something unique about the U.S. It is not merely that citizens of the United States have greater access to handguns, but also that our attitudes about their possession and use are different. In Switzerland, for example, the nature of the militia is such that one in every four households contains a fully automatic weapon. (5) Yet the use of handguns as instruments of violence is low.

In the United States handguns are the most common type of firearm involved in gunshot deaths in the home, whether accidental or intentional. (6) The most common reason given for owning a handgun is self-defense. (7) However, only 2% of handgun killings by private citizens are adjudicated as "justifiable homicide." (8)

A primary basis for the American phenomenon is an interpretation of the Second Amendment–actually a *mis*interpretation–by particular special interest groups in pursuit of specific political agendas. (9) During the 1991-92 federal elections, for example, the Political Victory Fund of the National Rifle Association invested nearly $65 million to elect or re-elect candidates whose views on gun control were in sync with its own. (10) This organization and others have been tremendously successful in a campaign of misinformation about the Second Amendment to the Constitution and the right to bear arms. Even among legislators, most of whom hold law degrees and therefore should not be so easily persuaded on issues of Constitutional interpretation, it seems to be an unquestioned assumption that the right of individual citizens to possess handguns is embedded in the Constitution.

The language of the Second Amendment is short and to the point: "A well regulated militia, being necessary to the security of a free state, the right of the people to keep and bear arms, shall not be infringed." (11)

In *U.S. v. Miller* the Supreme Court ruled in 1939 that the right conferred by the Second Amendment is a collective right, not an individual right:

> The Constitution as originally adopted granted to the Congress power–"To provide for calling forth the Militia to execute the Laws of the Union, suppress Insurrections and repel Invasions; To provide for organizing, arming, and disciplining, the Militia, and for governing such Part of them as may be employed in the Service of the United States, reserving to the States respectively, the Appointment of Officers, and the Authority of training the Militia according to the discipline prescribed by Congress." With obvious purpose to assure the continuation and render possible the effectiveness of such forces the declaration and guarantee of the Second Amendment were made. It must be interpreted and applied with that end in view. (12)

Mr. Justice Reynolds went on to say that state constitutions with provisions for the right to keep and bear arms should also be interpreted as conferring a *collective* right related to "ordinary military equipment [the use of which] could contribute to the common defense." (13)

Therefore, the federal government and the states may constitutionally control or even ban access to firearms by civilians. Unfortunately, confusion on this point abounds, even though federal and state gun control laws have consistently been upheld. (14) For example, Dr. Edward Ezell, curator of the National Firearms Collection at the Smithsonian Institute's National Museum of American History, testified before the Senate Judiciary Committee in 1989 that the *central issue* in the gun control debate is one of the individual's right to possess a firearm versus the issue of public health and safety. (15) Dr. Ezell's inference as to the existence and basis of such an individual right unfortunately was not challenged by members of the committee.

The easy accessibility to firearms which characterizes our nation is viewed with considerable bafflement in other countries. In Great Britain, where personal protection is an insufficient ground for obtaining a gun license, there was an understandable failure to perceive why Virginia's legislation limiting handgun purchases by its citizens to one handgun per person per month (passed despite NRA opposition) was viewed as a "great victory for gun control." (16)

Death and Injury from Firearms Constitute a Major Public Health Crisis in the U.S.A Particularly Among the Young

From 1960 to 1980 the population of the United States increased by 26% while the homicide rate due to firearms increased by 160%. (17) At a time when so much attention is focused on lowering the costs of health care, it should be noted that the treatment of firearms injuries requires tremendous expenditures of human and financial resources. The national cost for first hospitalizations due to firearms injuries in 1984 was estimated to be $429 million. (18) The total *direct* costs of treatment including hospitalizations, professional fees, rehabilitation, physical therapy and long-term care probably exceed $1 billion annually; associated *indirect* costs are thought to be in excess of $2 billions. (19)

It would appear that a disproportionate amount of these health care dollars is spent treating the wounds of young people between the ages of 15 and 19. The homicide rate among this age group has risen 53% since 1984 and continues to increase in large part due to injuries from firearms. (20) Firearm homicide is the second-leading cause of death for all 15-through 19-year-olds, and it has been increasing more rapidly than any other cause of death. (21) Similarly, suicide is the third leading cause of death among children and adolescents in the U.S., a rate that has doubled in the last 30 years, with the increase also attributed almost exclusively to availability of firearms. (22)

The tremendous impact these trends have on public health can only be fully appreciated by including non-fatal firearm injuries which are thought to occur 2.4-fold for every firearm fatality. (23) Many of these injuries cause permanent disability. Additionally, a discussion of the scope of firearm fatalities *against* America's youth is incomplete without consideration of the fact that not only are young people being increasingly victimized, they are also with rising frequency the perpetrators of violent acts. Over a five-year period from 1984 to 1989 the number of firearm murders committed by offenders under 18 more than doubled (444 in 1984 to 952 in 1989). (24) Thus, an assessment of lost years of life should include not only victims of violence, but also the wasted potential of young offenders who often live out a cycle of criminal activity and incarceration that lasts for decades.

Young Black Males are the Highest Risk Group

The homicide rate among black males (ages 15-19) increased 71% from 1984 to 1987. (25) (Other leading causes of death among this group such as motor vehicle crashes, cancer, heart disease, and non-firearm suicide did not change significantly during the ten-year period between 1979 and 1989. [26]) Currently the rate of homicide among black males between the ages of 15 and 24 is seven to eight times the rate for white males in the same age category, and it is 17 to 283 times the rate of males in the same age group in other developed nations. (27)

It is important to understand, however, that minority status alone is not an indicator for the risk of violent behavior or victimization. (28) Rather, minority status is linked with other factors such as socioeconomic status, living in particular geographic areas, risk for gang membership and family violence, etc. (28) Thus, although the need for public health intervention strategies is particularly great in specific communities, any intervention must be "culturally sensitive and culturally specific" in order to have maximum impact. (29)

Factors Which Make Young Children Particularly Vulnerable

Research indicates that people are most likely to be shot by people they know and most likely to shoot individuals in their own age group. (30) Unfortunately this applies not only to adults and young people, but also to the youngest members of our community. Unintentional shootings account for almost one-half of shootings among younger children, most commonly by children who play with loaded weapons they find in the home. (31) Toy gun and pretend-gun play are nearly universal activities among children of both sexes, thus creating confusion among the very young who already are unable to consistently distinguish between what is pretend and what is real. It is therefore alarming to note that unsafe storage of firearms (such as keeping handguns loaded and not under lock and key) is not uncommon among families with young children. (32, 33, 34) In 1988, 1,501 unintentional firearm deaths were reported in the United States; 277 were children under the age of 15. More than 70% of the deaths involved use of a handgun in or near the home of the victim. (35)

Again we find, not surprisingly, that the environment in which children live significantly impacts their view of the world. For example, in one study in which 208 children with a mean age of 8.4 were asked, "Do you think you might ever shoot someone?" they were more likely to respond in the affirmative if their parents were gun owners. (36)

Perhaps because children do not vote, have no money to contribute to political campaigns and exercise no control over the media, the extent to which their health is threatened by firearms has until very recently been overlooked; the health status of the very young is still eclipsed by the recent spate of reports on teenage violence. However, Antonia C. Novello, Former Surgeon General, has noted that while the medical community conducts clinical trials focusing on various crippling and lethal illnesses which attack children, in fact violence kills more children in the U.S. than disease. (37) Each day in the United States 30 children receive injuries from handguns. (38)

Accessibility and Availability of Firearms

Although accessibility to firearms and their general availability are not the only factors accounting for the rates of suicide and homicide among children and youth, they do appear to be significant.

A comparative study of Seattle, Washington, and Vancouver, British Columbia, from 1980 through 1986 revealed that although the two cities had similar overall rates of criminal activity and assault, there was almost a fivefold greater risk of being murdered with a handgun in Seattle. (39) This was directly attributed to the fact that Vancouver had a lower rate of gun ownership (and hence availability) because of its more restrictive handgun regulations. (40) (For example, handguns could not be purchased in Vancouver for self-defense; concealed weapons were forbidden; and the transportation, discharge and recreational use of firearms were permitted but regulated. [41])

The same parallel between incidence of suicide and availability of and accessibility to firearms can also be made. Specialists in suicide research have noted that the methods used in a given setting are less instructive of the dynamics of suicide pathology than of the lethality and availability of those chosen methods. (42) It is interesting to note that when available means of suicide are withdrawn, overall suicide rates decline; i.e., there is not an increase of suicide by other methods. In England and Wales this was seen during the years between 1960 and 1980 when carbon monoxide was gradually eliminated from domestic gas. (43) Similar results occurred in Australia when legal limits were placed on the amount of sedatives physicians could prescribe at one time. (44) In both instances the incidence of suicide declined overall.

Similar results for suicide and homicide were observed in Washington, D.C. when legislation enacted in 1976 banned the purchase, sale, transfer and possession of firearms by civilians. Comparison of the rates of homicide and suicide from 1968 to 1987 in the area covered by the legislation revealed that after 1976 firearm homicides declined by 25% and firearm suicides declined by 23%. (45) Furthermore, no similar reductions over the same time period were observed in the areas adjacent to the legislated area, nor were there any compensatory increases of homicide or suicide by other means within the vicinity. (46)

These findings indicate that it cannot be assumed that people will resort to other means of suicide and homicide if firearm restrictions are tightened. Although exceptions are likely in the cases of severely suicidal or sociopathic individuals, the evidence regarding restriction of available means seems particularly worthy of consideration when designing prevention strategies for teenagers, a population particularly apt to act on impulse rather than deliberation. Yet, one study indicates that nearly 5% of U.S. high school students carry guns to class. (47)

Conclusion

The use of handguns in the U.S. results in more than 30,000 adult deaths plus numerous injuries each year. (48) Many of these adults are parents, grandparents, or other significant figures in the lives of children. Additionally, children themselves are victims of handgun violence; more than 10% of all deaths among children and 20% of deaths among teenagers can be attributed to gunshots. (49) What is particularly significant about these alarming statistics from a public health perspective is that such fatalities and injuries are in most instances preventable. Discussion of prevention and design of effective strategies, however, is not possible using a traditional definition of disease.

Public health officials must align themselves with others from varying disciplines, including legislators (advocating stricter gun control), engineers (who can improve handgun design to include safety features), and mental health practitioners (for the purpose of designing age- and culture-specific programs teaching constructive ways to express anger and resolve conflict), to devise comprehensive approaches which take into account not only the physical and emotional impact of the problem on victims and their families, but the underlying social causes as well.

The health of children is directly related to the vitality of the communities in which they live. Thus, preparing environments for the 21st Century must include a consideration of the social environment in which children can best be protected and nurtured.

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Preparing Arts Environments for the 21st Century

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As I look towards the end of the century, I am struck by the place that the arts could have in the era ahead. The potential, the great potential is in their ability to herald the affective side in an Age of Information and Technologies that make communication more facile. For in this world of computer and FAX, of E-Mail and Modem, there are new possibilities. Let's list a few for individual artists:

The Literary Arts–the writing of poetry and of other literary forms–have been given the gift of technology. There are those who fight it, but it's there for the taking to make it easy to write, easy to alter, easy to perfect, easy to save . . . to make the whole process easier. The possibilities of letters again, of communication as wonderful as we once knew before the telephone, as literate and literary are exciting.

Musicians and modems: there are programs that can make the job of copying compositions easier, faster, and neater. The composer is in command of his own manuscript; time is in the hands of the artist.

Dancers and documents that everyone can read and interpret. New choreographic potential, new languages using this equipment. Colors for movements, lines for stage direction, shapes for interpretation.

The potential of Computer Assisted Design (CAD) and the Xerox machine is there for architects and artists. How? for drawings, for studies and cartoons, for larger works, and as a challenge to the creator. There are many, many choices. Once there were only oil paints!

I find these choices exciting in the environments of the 21st century. What about the larger environment.

The Human Race–people–you and I will be newly united with ourselves and others through the arts. The Arts and Humanities will have new meaning–new humanness–for they will represent an appreciated bastion of teamwork–the cast of a play–the chorale–the instrumental musical ensemble–the crew creating a video. The good feeling of working and achieving together.

People gatherers in process and product feed a human need; people will want to think, create, and celebrate together more than ever . . . for the meaning in life is really that. The arts have that going for them–they ARE the gatherers of people. The affective side will be more in need.

As audiences, we will share, as never before, the satisfactions of an artistic experience. When it's really satisfying, we know what a good feeling that is. The affective side.

The 21st Century. Calvin and Hobbes gives us hope that our ability to conquer dreams and fears takes us into realms only the imagination can conjure up. The taking flight, the sense of conquering, the daring to risk is the beauty of self-esteem. The arts help us gain that sense of self and potential . . . in the face of parents (C and H) . . . and of institution.

To help each other institutionally, we will need to work together. Old institutions and new institutions will need to identify the factors involved in meaningful exchange and identify collaborations that are possible. Which activities, programs, outreach or marketing efforts can be shared? When should we look, as part of everyday institutional life, at the possibilities for sharing resources? Where are the win-win situations for the new century? What are the catalysts for understanding? What are new paths for collaborative efforts? Who can be partners, teams, allies in sponsoring, promoting, marketing to individuals, families, school groups? Is there an affordable ticket if we really address some of the issues and solutions? A collaborative relationship takes considerable time and effort to develop. The resources and rewards can be significant as people and institutions move from "going it alone" to interdependence.

Teleconferencing is a new tool for expanding our impact. The technology is there; the only need is for inventive minds to use it well. It can educate whole communities; it can serve to put ideas across, discuss, debate, educate. Once up and on satellite, the discussion can be worldwide. We need the skills to make it interesting, compelling, thought provoking, and uniting.

In the Sunday February 6, 1994 Arts and Leisure section of the *New York Times*, the lead article addressed the struggle of some of the older traditional performing institutions to redefine their missions in a changing and diverse world. Chronicling the ways in which classical music institutions in different parts of the country tried to reach new audiences, it also told of the multicultural issues they encountered. Institutions that have relied on Caucasian largely Eastern European audiences are finding their support base shrinking and are struggling to adjust. Groups of performers from other cultures, Asian or African-American, are specializing in filling niches. Will this work with the varying sets of philanthropic priorities and social agendas?

In the Museum world, a publication borne of several years' self-study, Excellence and Equity leaves us with the same messages of the need to include the community in new and meaningful ways.

Who *are* the audiences of the next century? I've been reading *Fascinating Rhythm* a story of the collaboration of Ira and George Gershwin written by Deena Rosenberg, a cultural musical historian. Their collaboration was about changing audiences . . . and at the same time reflecting the American audience. Rosenberg cites George Gershwin's writing:

> I'd like to write . . . of the melting pot . . . with its blend of native and immigrant strains. This would allow for many kinds of music, black and white, Eastern and Western, and would call for a style that should achieve, out of this diversity, an artistic unity . . . is a meeting place, a rendezvous of nations. I'd like to catch the rhythms of these interfusing peoples, to show them clashing and blending.

Brenda Berck, in her article "Museums: Rethinking the Boundaries," asks:

> Where do museums fit into the picture? Are we simply repositories of material evidence of the collective memory of what has been? Is it only science museums and museums of contemporary art which relate to the contemporary world? Does our position in society remain as static as some of our collections or do museums have a responsibility to take initiative in the service of society and of its development? (69)

She goes on to say "The partnership most critically needed is the partnership between museums and the society we claim to serve . . . . who knows what new boundries will be set" (69)?

For the past decade, I've been heavily involved with the Cleveland Children's Museum and have been thinking about these museums and the impact they are having on individuals, schools, other museums, and their communities. Jonathan Katz, Director of the National Assembly of State Arts Agencies, has said to me recently that he believes that Children's Museums will be an important community force in the future. In our eight years of existence, we can already lay claim to some things to think about: introduction into this community of James Comer and Howard Gardner, brought by the CCM to Cleveland in a series of symposia on perspectives on education. Their names are now household words in the City of Cleveland Schools Vision 21 program. We have a joint collaborative project, the People Puzzle exhibit on prejudice and giving children the skills to live in our diverse world. A few months ago, we sponsored (with the National Conference of Christians and Jews), a *People Puzzle: Teleconference on the Impact of Prejudice on Children,** with Lee Fisher moderating a panel of local experts (such as Stephanie Tubbs Jones, Billie Osborne, Donald Freedheim, David Rue, Darlyne Bailey) from a variety of disciplines related to the issues. 1000 people discussed the subject as part of the experience and sent in 75 calls. Six public broad-casts have been aired. There is a task force looking at next steps now. All of this from a museum.

Collaboration, diversity, community. The institutions of the next century are going to need to think of how they can build and expand the integrity of their own exhibits. It is an invigorating challenge!

The 21st century is full of promise for the arts. Positioning them to take full advantage of the options in technology opening to us, including community as part and parcel of institutional life, and finding natural partners and collaborators are the challenges. I find it very exciting.

*Tapes of the Teleconference are available from the Cleveland Children's Museum.

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